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Seven studies dealing with adjustment to technological change which were done by independent experts are presented. "Programs in Aid of the Poor," by Sar A. Levitan assesses the state of social insurance, public assistance, the poverty program and other assistance to the poor and compares them to current proposals as the negative income tax. "Manpower Adjustments to Automation and Technological Change in Western Europe and the United States which were designed to aid displaced workers. "Technology and the Negro," by Mahlon Puryear, examines the problems of Negroes due to technological developments. "The Uses of Systems Analysis in Manpower Adjustment," by Evelyn Murphy and Gary Stonebraker, reports a pilot project on the use of the computer to analyze the adjustment process in the labor market. "The Role of the Federal Government in Technological Forecasting," by Donald Schon, surveys the art of manpower projections and the needs of projection users. "The Effects of Wages on the Relative Employment of Unskilled Labor," by Malcolm S. Cohen, examines questions relative to the effects of minimum wages on unskilled employment. Nat Weinberg made a proposal for the "Use of Investment Tax Credit to Facilitate Adjustment." Other appendixes to VT 003 962 are VT 003 960, VT 003 961 and VT 005 794- VT 005 797.

ADJUSTING TO CHANGE

Appendix Volume III
TECHNOLOGY AND THE AMERICAN ECONOMY, The Report of the Commission

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Studies prepared for the National Commission on Technology, Automation, and Economic Progress • February 1966

ADJUSTING TO CHANGE

Appendix Volume III

TECHNOLOGY AND THE AMERICAN ECONOMY,

The Report of the Commission

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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PREFACE

This volume is the third of six appendix volumes to Technology and the American Economy, the report of the National Commission on Technology, Automation, and Economic Progress. The full series of appendix volumes is as follows:

I. The Outlook for Technogical Change and Employment
II. The Employment Impact of Technological Change
III. Adjusting to Change
IV. Educational Implications of Technological Change
IV. Applying Technology to Unmet Needs
VI. Statements Relating to the Impact of Technological Change

The volume contains seven studies dealing with adjusting to technological change, prepared by independent experts at the request of the Commission.

Sar Levitan assesses the present state of social insurance, public assistance, the poverty program, and other assistance to the poor and compares them with such current proposals as the negative income tax. He concludes that improvement of the present system is more practical politically and economically than a shift to some new form of income maintenance.

Jack Steiber makes a careful comparison between Western European and U.S. programs designed to aid displaced workers in adjusting to the impact of technological and other changes, concluding, in general, that there are many lessons for us to learn.

Mahlon Puryear of the Urban League examines the particular problems posed for Negroes by recent technological developments.

Evelyn Murphy and Gary Stonebraker undertook, under the joint auspices of the Commission and the Institute of Applied Technology in the National Bureau of Standards, an experiment in the use of the computer in analyzing the process of adjustment to change as it occurs in the labor market. The pilot study demonstrated intriguing possibilities which are to be further explored under Government auspices.

An intergovernmental task force, headed by Donald Schon of the Institute of Applied Technology, also in part at the behest of the Commission, surveyed the state of the art and the needs of users of projections of the manpower impacts of foreseeable technological change.

Cohen examines the effect of minimum wages on the employment of the unskilled raising worthwhile questions even though not providing conclusive results.

Nat Weinberg of the United Auto Workers made a proposal through Commission member Walter Reuther for an investment tax credit to encourage employer efforts to facilitate adjustment to change. Since the suggestion was intriguing but was made too late for adequate consideration, the Commission directed its publication in the supplementary volumes.

Additional studies prepared for the Commission are contained in Appendix Volumes I, II, IV, and V. Appendix Volume VI contains a group of statements by various interested organizations and individuals in response to a request from the Commission for their views on the impact of technological change.

Though the Commission does not necessarily endorse the information and views of these documents, it considers them of sufficient value to have directed their publication.

This volume was edited and prepared for publication by Judith Huxley.

GARTH L. MANGUM,
Executive Secretary.

CONTENTS

Page
Names of Commission members ---- iii
Names of staff members ---- iv
Preface ---- v
Programs in aid of the poor ---- III-1
Manpower adjustments to automation and technological change in Western Europe ---- 41
Technology and the Negro ---- 127
The uses of systems analysis in manpower adjustment ---- 145
The role of the Federal Government in technological forecasting ---- 191
The effect of wages on the relative employment of unskilled labor ---- 239
Use of investment tax credit to facilitate adjustment ---- 269
Appendix. Members of the Commission and Interagency Advisory Committee ---- 275

OTHER APPENDIX VOLUMES PRINTED UNDER SEPARATE COVERS

I. The Outlook for Technological Change
II. The Employment Impact of Technological Change
IV. Educational Implications of Technological Change
V. Applying Technology to Unmet Needs
VI. Statements Relating to the Impact of Technological Change

PROGRAMS IN AID OF THE POOR

Prepared for the Commission
by
Sar A. Levitan
The W. E. Upjohn Institute for Employment Research
Washington, D.C.

CONTENTS

Page

Who are the poor? III-5

The American welfare system 6

    Income maintenance programs for the poor outside the labor force 7

    Programs for the poor in the work force 15

    Provision of services and goods 25

Alternative income support programs 32

    Family allowances 32

    Negative income tax 32

    Competing goals 33

Short-run priorities 35

    Planned parenthood 36

    Aiding impoverished children 37

    Job creation and work relief 38

    Housing 39

Is business "as usual" feasible? 40

Programs in Aid of the Poor [1]

A decent provision for the poor is the true test of civilization.
—Samuel Johnson.

The purpose of this paper is to review and appraise existing programs in aid of the poor and to explore feasible approaches to the alleviation of poverty during the remainder of this decade. After listing some characteristics of the poor, the paper summarizes the major measures now in effect, focusing on the operation of the Federal welfare system which is divided into three types of programs: Income maintenance programs aimed largely at aiding the poor outside the work force; programs in aid of the poor in the work force; and programs supplying goods and services. The final section is an examination of some proposals currently in vogue and a discussion of programs that might be adopted in the short run.

Who Are the Poor?

Poverty is a generic term for many types of deprivation. Its roots penetrate deeply and affect many elements of society. Yet to measure even the material dimensions of poverty is an elusive task, for there exists no one universally accepted definition of economic poverty. This is hardly surprising, in view of the many factors which determine the amount of money income necessary to provide for the basic needs of any individual or family. Programs supported by government, such as free education, subsidized food, or medical care, reduce the amount of money required to support a family. Differentials in the cost of living between urban and rural areas and among regions raise the income requirements of some people and lower them for others. And, finally, the concept of basic (or minimum) needs does not remain constant as our society becomes more affluent generally. It is no wonder, then, that experts differ as to the amount of cash income necessary for a family to reach a minimum acceptable level of economic welfare.

While there is no consensus about the income needed by individuals and families to maintain them at a level above the threshold of poverty, the data prepared by Miss Mollie Orshansky of the Social Security Administration are widely accepted. Using detailed studies of consumer expenditure patterns, Orshansky has estimated that the minimum cost to feed an individual living as part of a household was 70 cents a day in 1963, and that food expenditures should account for no more than one-third of a low-income family's total cost of living. These basic data were further refined to take account of the age and sex of the family head and the number of persons in the household. It was further estimated that families residing on farms need 40 percent less cash income than nonfarm families. A summary of the Social Security Administration's poverty income criteria is presented in table 1.

TABLE 1. POVERTY INCOME CRITERIA

Number of family members	Nonfarm	Farm
1 Under age 65	$1,580	$1,105
1 Age 65 or over	1,470	1,030
2 Under age 65	2,050	1,435
2 Age 65 or over	1,850	1,295
3	2,440	1,710
4	3,130	2,190
5	3,685	2,580
6	4,135	2,895
7 Or more (average)	5,090	3,565

SOURCE: Mollie Orshansky, "Counting the Poor," *Social Security Bulletin*, January 1965, table E, p. 28. A summary of the methodology appears in Mollie Orshansky, "Who's Who Among the Poor: A Demographic View of Poverty," *Social Security Bulletin*, July 1965, pp. 8–9; in this article Orshansky revised upward the minimum cash income of farm families to 70 percent of nonfarm families.

These criteria yielded a total of 34.6 million persons living under the poverty threshold in 1963, including 7.2 million families and 4.9 million "unrelated individuals." Some significant facts emerge from Orshansky's study which have definite policy implications for the war on poverty.

1. The incidence of poverty rises with the number of children in the family. Two factors are involved: First, persons at the lower end of the income spectrum tend to have more children; and second, the increase in the number of children in a family tends

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[1] This paper is part of a W. E. Upjohn Institute for Employment Research study, "The Great Society's Poor Law: A New Approach to Poverty," devoted to an evaluation of the Economic Opportunity Act and financed by a grant from the Ford Foundation.

to boost family needs without commensurate increases in income, thus throwing the large families into the poverty category. According to the Social Security Administration criteria, out of eight families with one child, only one was in the poverty group, compared to one-half of the families with six children. Nearly half of the 15 million children of the poor were being raised in families with 5 or more children. A total of 5.7 million children were raised by the 2 million impoverished families whose heads worked the full year on full-time jobs.

2. Females headed 2 million poor households, consisting of 7.4 million persons, including 4.4 million children. Only 3 of every 10 female heads of poor households were employed at all during 1963. These families were subject to the most abject poverty, and a doubling of their income would have been required to raise them above the threshold of poverty. The average income deficit below the poverty threshold for the 7.4 million members of households headed by a female was nearly $400 per person; for the 22.3 million members of impoverished families headed by a male, the figure was little more than half that amount.

3. More than one-fifth of the poverty stricken households were headed by a person aged 65 or older, and an additional 2.5 million aged poor lived alone or not as part of a family.

4. Nearly 3 of every 5 impoverished family heads were in the labor force during 1963, including 2 million (95 percent male) who worked on full-time jobs throughout the year. Although one-fourth of the impoverished families had more than one breadwinner, the combined income of the earners was not adequate to raise their families above the poverty threshold. The conclusion is inescapable that for millions of large American families the rewards of the wage system are inadequate to permit them to escape poverty.

5. Of every four unemployed persons in March 1964, one was counted among the poor, compared with one-ninth of the employed. The incidence of unemployment was more than three times higher among heads of poor families than among heads of other families. And members of households where the head was unemployed were subject to double the rate of unemployment of nonpoor families whose head was also unemployed. Members of poor households were also less likely to be in the labor force than members of nonpoor households. This holds true for every age group.

The American Welfare System

Over the past 30 years, the United States has developed an intricate, though far from comprehensive, welfare system. The underlying assumption of this system is that special programs are needed to take care of the diverse needs of the poor. It has been suggested that in practice these programs are more a series of makeshift measures than tailormade programs, and that millions of needy receive little or no aid. And the assistance offered in most cases is inadequate to raise the beneficiaries above the poverty level.

The welfare system consists of three types of programs:

1. Programs which offer cash assistance mainly to those outside the labor force. These include old-age, survivors, and disability insurance; public assistance programs under the Social Security Act; pensions for needy veterans; and general assistance for needy persons not covered by the Social Security Act and financed exclusively by States and localities.

2. Programs to aid those in the work force. These include training to equip the poor with skills that are salable in the labor market, aid to depressed areas, unemployment insurance, minimum wage protection, job creation, and work relief.

3. Programs that provide services and goods to the poor on the basis of need regardless of labor force status. Included in this group are child care, subsidized housing, medical services and drugs, and several forms of food distribution.

The distinction between programs aimed for the working poor and for those outside the labor force is useful and in accordance with the prevailing values of our society. This distinction is reflected in existing programs and is likely to be a controlling factor in developing further programs in aid of the poor.

It is assumed that special tailormade programs are needed to bolster the level of living of the working poor. This might be accomplished best by providing them with services and goods which are not likely to diminish the incentive to work, and by equipping them for more productive jobs whenever feasible. For those outside the labor force, burdened with impediments which preclude gainful employment, society's help to the poor must consist of providing a combination of services and income; in some cases, however, as conditions of individuals and family responsibilities change, training may also be appropriate.

The inherent difficulties of dividing the poor according to their labor force status are obvious. Official definitions of labor force are of only limited help. Many of the poor move in and out of the labor force, depending upon overall economic conditions and personal circumstances. It is also difficult to determine a priori those individuals who should be provided basic income through work (wages), and those who should be provided support through public assistance. For example, should a female head of a family with minor dependents and no regular income be required to work for support, or should the State assume the obligation of making direct contributions for her family's sustenance? Experts disagree as to whether society would be better served by providing work for the mother (assuming jobs are available), or by providing income which would permit the mother to devote full time to rearing her children. Some who favor the latter approach suggest that a redefinition of remunerative work may be in order to include, for example, child rearing.

Observers would also disagree about the usefulness of providing the poor with income maintenance in addition to services and goods. Some would argue that the most appropriate way of assisting the poor is to supply them with cash, under the assumption that the family unit itself is the best judge in allocating the minimum available resources. Others maintain that the Government can provide the services more efficiently by utilizing economies of large-scale enterprise, and that in any event existing institutions are often inadequate to supply the needs of the poor. It has been argued, for example, that adequate housing facilities for the poor will not be provided without direct Government action, particularly where racial discrimination is involved. A final argument against income maintenance is that persons of low educational and economic attainment are only too frequently poor managers of even the limited resources available to them.

The inclusion of some of the specific programs within each of the three categories is also subject to controversy. For example, the inclusion of old-age, survivors, and disability insurance as part of the welfare system may be questioned since the eligibility test for OASDI is not based on personal need. OASDI is paid to the rich and poor alike, and about half of the funds distributed under this program go to those who are above the poverty threshold.

Income Maintenance Programs for the Poor Outside the Labor Force

The Social Security Act, now the product of three decades of evolution, is the basic instrument for providing income maintenance for persons outside the labor force. This act has created two distinct groups of beneficiaries: Some receive payments regardless of the economic resources of individual recipients, while others qualify for benefits only upon the determination of individual need. The distinction between the two types of programs is made on the basis of prior contributions. Those who made payroll contributions qualify to receive benefits for themselves, their dependents, and their survivors as a matter of right; they are not required to establish personal need.

Old-Age, Survivors, and Disability Insurance

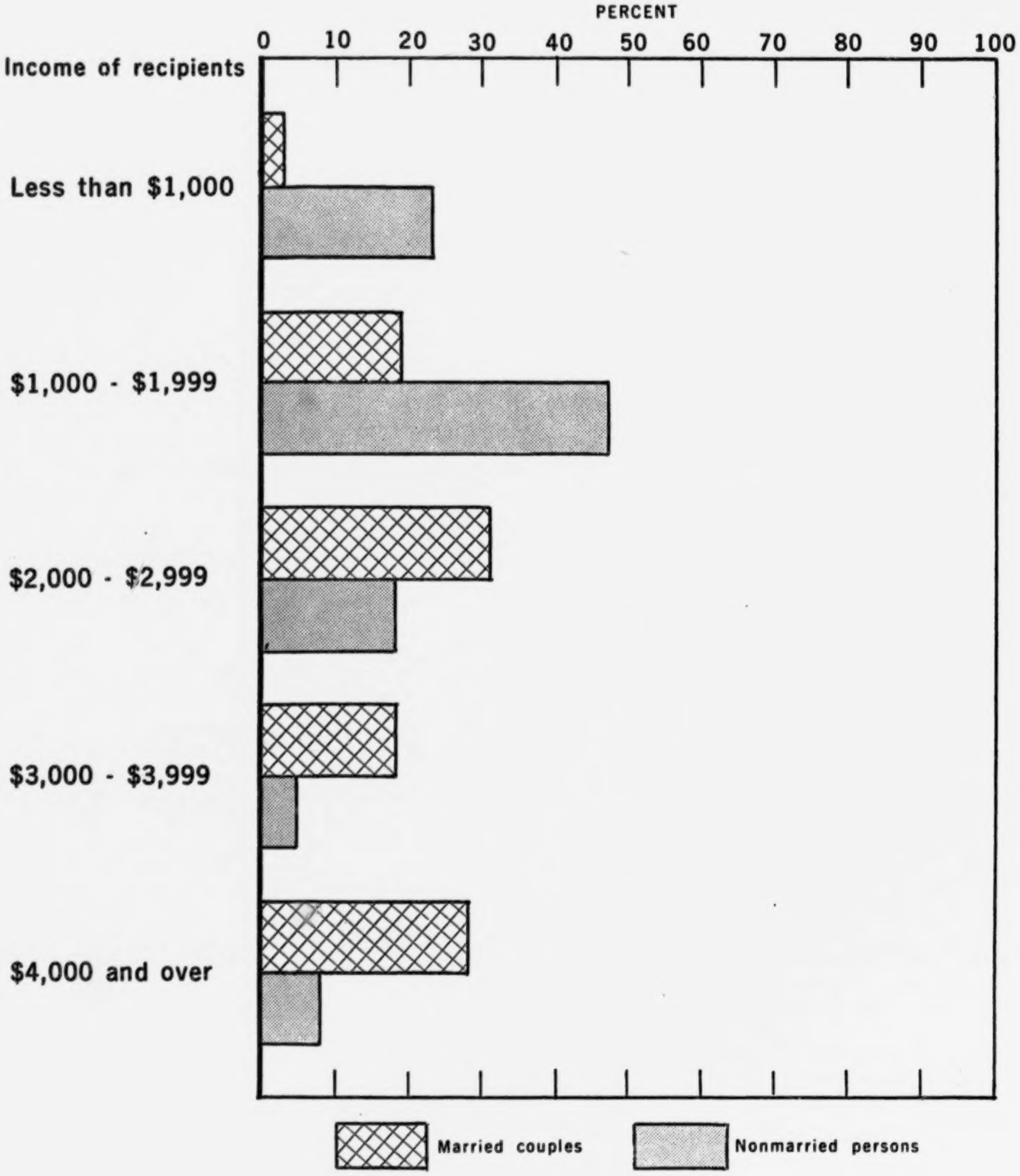
In reality, the insurance features of old-age, survivors, and disability insurance are partially based on Government fiat rather than hard-cash contributions. OASDI benefits are heavily weighted in favor of low earners, and only minimum qualifications are needed to entitle a person to receive benefits. A beneficiary with qualifying dependents may receive twice the amount of another person who may have made identical contributions. The monthly payments to a primary beneficiary who made maximum contributions based on annual earnings of $4,800 (prior to the 1965 amendments to the Social Security Act) were only about double the payments made to an individual who paid social security taxes on earnings of only $1,320 a year, though the former had contributed nearly four times as much in taxes. Whether the above ratio holds true for lifetime benefits is not known, since longevity data based on income are inadequate to form any conclusive opinion on this matter.

Average annual benefits for a single retiree in 1965, including the 7-percent increase provided by the 1965 amendments to the Social Security Act, amount to less than $1,000; the benefits for an aged couple are 50 percent higher. This average level of benefits is just about sufficient to meet the minimum requirements of aged beneficiaries residing on farms; those living in urban areas must live in povery if they depend upon social security payments as the sole means of support.

For purposes of a discussion about poverty, the level of OASDI benefits is relevant to three of every four beneficiaries. The Social Security Administration estimated that 41 percent of the 11 million retired OASDI beneficiaries in 1962, aged 65 and over, were living in poverty with an income below $1,500 for individuals and below $1,800 for couples. For another 3.7 million (34 percent) beneficiaries, however, OASDI payments raised their income above the poverty threshold. The remainder, 25 percent, had an income above the poverty level even without the OASDI payments. The above estimates were based on money income alone and did not include homeownership or other income in kind.

Total payments to retired OASDI beneficiaries in 1962 amounted to $10.5 billion, with $6.1 billion paid to married persons and $4.4 billion to nonmarried aged 65 and over. Only a fifth of the total OASDI benefits was paid to couples with an income of less than $2,000. Nearly half of the $6.1 billion was paid to couples with an income above $3,000. About half of the OASDI benefits went to individuals with an annual income of less than $1,500. Thus, about half of the total OASDI benefits was paid to persons who had income above the poverty threshold, even without the OASDI benefits. The distribution of the $10.5 billion benefits in 1962 paid to aged beneficiaries by their income level is presented in chart 1.

Chart 1.
PERCENT DISTRIBUTION OF OASDI BENEFITS TO THE AGED BY INCOME LEVEL OF RECIPIENTS
1962



Source: U.S. Department of Health, Education, and Welfare.

The fact that about half of the total OASDI disbursements to the aged was paid to persons above the poverty threshold is certainly no argument against these benefits. (Even the most affluent beneficiaries were entitled to the payments on the basis of their contributions.) What it does show is that present contributions made to the system are inadequate to permit millions of beneficiaries to escape poverty, if the system is to be kept on an actuarially sound basis. One obvious solution would be to raise the contributions made by low earners so that they could be paid higher benefits upon retirement. But this would decrease their take-home pay, further reducing already limited resources during their work life. An alternative approach would be to add the Government as a third contributory partner to the OASDI. At present, contributions to the system are made only by employers and employees. The Government could conceivably make up the difference between present OASDI contributions and payment levels needed to permit beneficiaries to escape poverty.

Public Assistance

In addition to supplying income to beneficiaries under OASDI, the Social Security Act provides monetary support for four impoverished groups: Old persons, blind, permanently and totally disabled, and families with dependent children. A total of $3.4 billion cash benefits was paid under these four programs in 1964 to a monthly average of nearly 7 million beneficiaries. The following tabulation presents the average number of beneficiaries and the cost of these programs in fiscal 1964.

Program	*Number (thousands)*	*Benefits*[1] *(millions)*
Total	6,955	$3,446.0
Old-age assistance (OAA)	2,176	1,610.1
Blind	97	85.7
Permanently and totally disabled	505	335.1
Families with dependent children	4,177	1,415.1

[1] Excludes payments to suppliers of medical care (vendor payments).

The above four public assistance programs are a cooperative effort of the Federal, State, and local governments, with the Federal Government contributing nearly 60 percent of the total costs. The maximum Federal share of aid to families with dependent children (AFDC) is $15 of the first $18 paid to beneficiaries plus 50 to 65 percent (depending on a State's fiscal capacity as measured by per capita income) of monthly benefits, ranging from $18 to $32. Monthly benefits in excess of $32 per recipient are paid exclusively from State and local funds. The Federal share is more generous for the other three programs, covering $31 of the first $37 monthly benefits paid to a recipient and 50 to 65 percent of additional benefits up to $75 per month. Before passage of the 1965 amendments to the Social Security Act, the Federal share of the contributions in all these public assistance programs was somewhat lower and applied to a maximum of $30 for AFDC and $70 for the other three programs (chart 2).

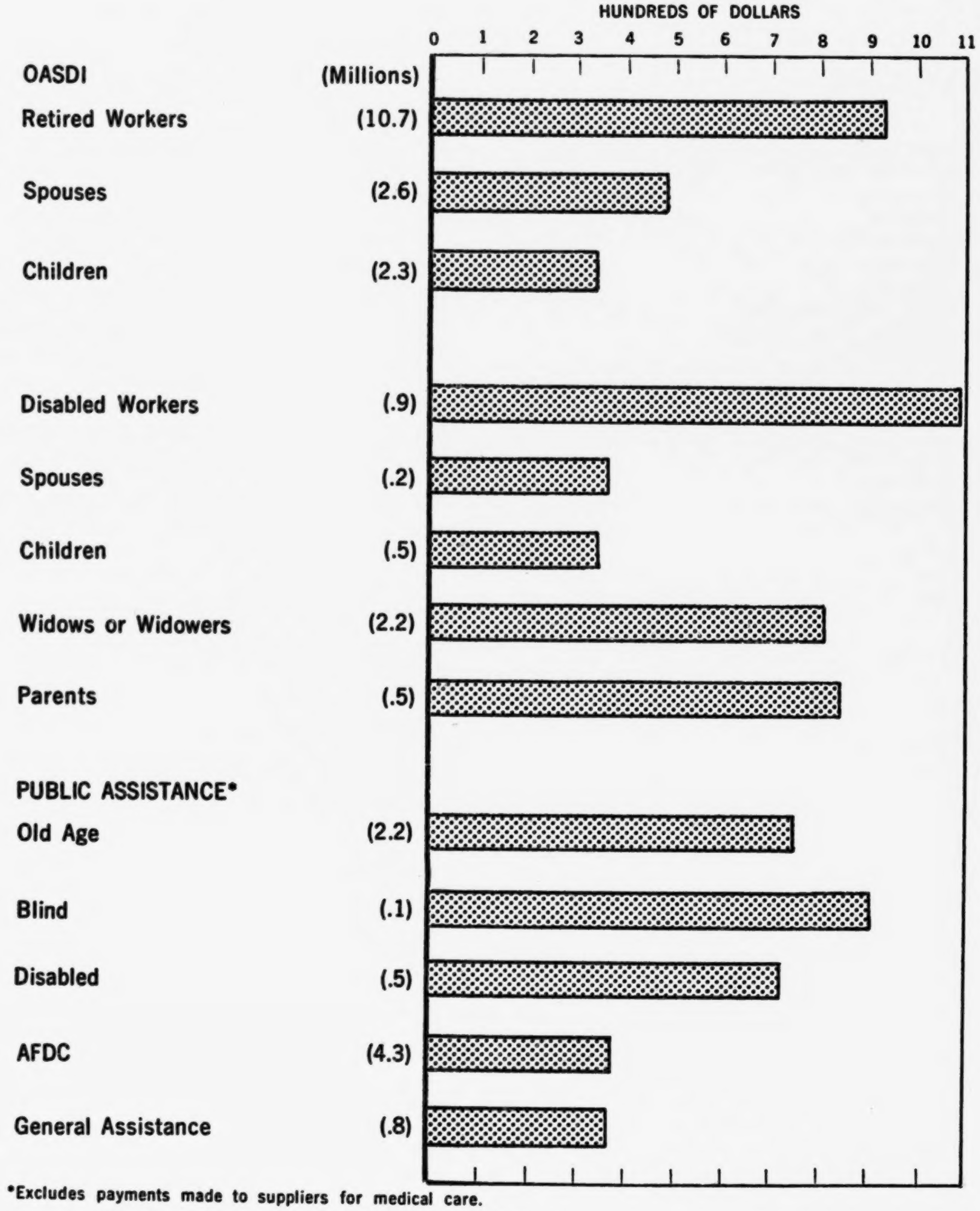
Though the Federal Government contributes nearly 60 percent of the total cost of the public assistance programs under the Social Security Act, the administration of these programs, within broad Federal standards, is left to the States; they determine qualifications, eligibility, and the level of benefits. The last-mentioned item is determined on the basis of "minimum needs" required by applicants for public assistance, a figure which varies widely among the States. For example, the median annual cost of basic needs calculated by the States for a mother with three children on AFDC in 1963 was $2,436, and ranged from $1,560 in Arkansas to $3,540 in Alaska. But in two of every three States, actual benefits were below the predetermined minimum needs. In 8 States, maximum benefits were less than half the minimum needs; and in another 10 States, maximum benefits ranged between 50 to 80 percent of minimum needs. Though States with relatively low per capita income tend to pay lower benefits, no precise correlation exists between the ability of a State to pay benefits, as measured by its per capita income, and the actual level of benefits paid to AFDC recipients. Delaware, with one of the highest per capita incomes, paid less than 50 percent of the predetermined minimum needs.

Public assistance for those destitute who fail to qualify under any of the above four categories may be paid by some States and localities without Federal participation. In 1964, such general assistance provided income maintenance for an average of about 800,000 persons at an annual cost of $273 million—an average of less than $7 a week per recipient.

The public assistance programs which provide some income to less than one of every four classified as poor have been under increasing attack from foes and friends alike. There is little controversy about old-age assistance, aid to the blind, and aid to the permanently and totally disabled, though the level of benefits varies widely among the States. OAA, the costliest of these programs, helps support about one of every eight persons aged 65 and over (the median age of the beneficiaries is about 77 years). Four of every 10 OAA recipients were also receiving aid from OASDI, but their income from the latter program was even below the meager minimum predetermined needs to qualify for OAA. With average annual cash benefits meeting barely half the minimum requirements of aged people under the Social Security Administration criteria, even critics of the welfare State find little fault with the benefits provided for the neediest aged population.

Chart 2.

NUMBER OF BENEFICIARIES AND AVERAGE ANNUAL CASH PAYMENTS PER BENEFICIARY - 1964



*Excludes payments made to suppliers for medical care.

Source: U.S. Department of Health, Education, and Welfare.

Controversy has focused on AFDC, particularly in those States where unemployed parents could qualify for benefits. The program has grown constantly since World War II in terms of cost and number of beneficiaries (chart 3).

A number of factors have contributed to the rise in AFDC recipients over the past 25 years. First and most obviously, the population under age 18 has increased by some 29 million. Second, the proportion as well as the number of broken homes has increased. Between 1950 and 1960, the percentage of families headed by a woman with her own children increased from 6 to 7 percent of total families with children. There has also been a steady increase in the number of illegitimate children during the past decade. Families headed by a female, particularly with illegitimate children, are candidates for AFDC.

In practice, it should be noted, AFDC may actually foster illegitimacy. If a mother on AFDC remarries, all assistance stops (on OASDI and VA pensions, children continue to receive benefits when their mother remarries). Thus, if a mother on AFDC remarries, the stepfather must assume responsibility for supporting his wife's children. This may deter remarriage of the AFDC mother, but it does not prevent the birth of illegitimate children.

Finally, liberalization of State and Federal laws has increased the number of persons qualifying for AFDC. Particularly significant are the 1961 amendments to the Social Security Act which qualified unemployed parents with dependent children to receive AFDC benefits. Eighteen States have accepted this provision, which has added some 350,000 AFDC beneficiaries during the past 4 years.

Quite apart from the mounting number of recipients, AFDC is vulnerable to attack on the grounds of certain socially unacceptable reasons which may qualify persons to receive AFDC benefits. In 1961, AFDC family characteristics showed nearly one child of every five was illegitimate; 7 percent of the fathers were in jail; the parents of nearly two-fifths of the children receiving benefits were estranged. The high incidence of illegitimacy and broken homes has served as a basis for attack on the relief system. A typical charge appeared recently in a national magazine article:

> Most of us base our scale of living and the size of our families on what we can earn. Relief turns this upside down: It sets a living scale per person and then makes the money available on that basis.[2]

The implication is clear: AFDC guarantees income and thus encourages illegitimacy. For those who have not caught the message, the article cited instances which showed that more than half of AFDC children were illegitimate. To illustrate the attractiveness of this form of relief, the article cited the case of a large family which received a monthly AFDC check of $495—about four times the average paid to families on AFDC.

In the same vein, a major newspaper editorialized that public assistance tends to deteriorate the moral fiber of the American people:

> The tangible costs of welfare are far from negligible, but the psychological damage of the whole complex of Federal handouts and pretended handouts is a far more important consideration. Its effects are visible on every hand, and have given impetus to a rising insistence on the fulfillment of "rights" which only yesterday were not regarded as rights at all—particularly, rights to be assuaged by the Federal Government through resort to its taxing and other coercive powers over citizens in general.[3]

Professor Eveline M. Burns of Columbia University, one of the Nation's leading authorities on social security, has questioned the criticism expressed by some that the public assistance system is "breeding a population of parasites" and "supporting the shiftless and wayward." She contends that such charges—

> . . . would surely be expressed less frequently if more were known about the rigorous eligibility conditions enforced in most parts of the country, or if the fact that some 90 percent of the assistance caseloads consists of the aged, the blind, the totally disabled, and mothers of young children was more widely appreciated.[4]

An examination of the characteristics of AFDC recipients would disclose that they are among the most deprived groups in the population. As previously stated, the total income of families receiving AFDC covers only half of the minimum basic needs of families.

The educational attainment of AFDC recipients is considerably below that of the rest of the population. According to a 1961 study,[5] mothers were present in 90 percent of AFDC families and more than a third of them had less than 8 years of schooling. Compared with other adult women in the United States, proportionately nearly three times as many AFDC mothers had failed to complete an elementary education. The educational attainment of the mother affected the duration of her family's dependence upon AFDC. The median duration of assistance for mothers with 5 years of school was in excess of 3 years, compared with 18.6 months for mothers who had graduated from high school.

While school attendance of AFDC children compared favorably with that of the total number of school-age children, they were retarded in

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[2] Earl and Anne Selby, "Why the Dole Doesn't Work," *The Reader's Digest*, March 1965, p. 79.

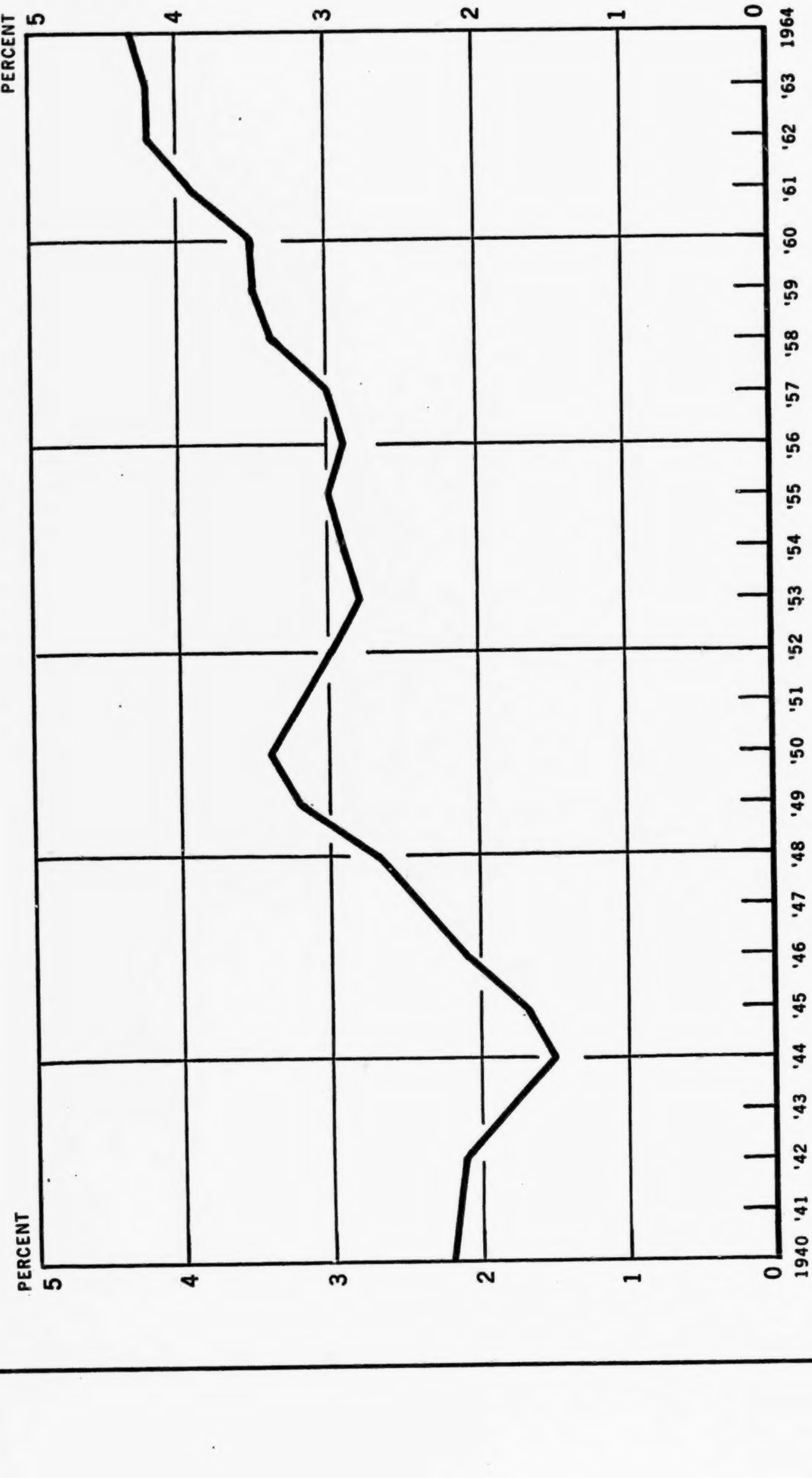
[3] *Chicago Tribune*, August 8, 1965.

[4] Eveline M. Burns, "What's Wrong With Public Welfare?" paper presented at the 60th Annual Conference of the New Jersey Welfare Council, Oct. 25, 1961, Asbury Park, N.J. (mimeographed).

[5] Robert H. Mugge, "Aid to Families With Dependent Children," *Social Security Bulletin*, March 1963, pp. 3–14; and "Education and AFDC," *Welfare in Review*, January 1964, pp. 1–14.

Chart 3.

PERCENTAGE OF TOTAL CHILDREN BELOW AGE 18 IN POPULATION RECEIVING AFDC
1940-64



Source: U.S. Department of Health, Education, and Welfare.

school achievement—at least one grade below normal for their age. The proportion of retarded AFDC children was more than double that of non-AFDC children. Another study found that 69 percent of the youths 18–24 years of age who had formerly received AFDC had not graduated from high school, while among all persons 18–24 years of age, 38 percent had not completed a high school education.[6]

In 1961, fathers were present in one-fifth of the AFDC families, but most of them were incapacitated. Two of every three incapacitated AFDC fathers and one-third of the unemployed AFDC fathers had less than an elementary school education. Only about one-fifth of the adult male population in the age category where AFDC fathers tend to concentrate had such low educational attainment. Since 1961, the number of unemployed fathers has increased.

Since the end of World War II, the increase in benefits paid to AFDC recipients has lagged behind those of other categories of federally subsidized public assistance programs. While increases in average old-age assistance have kept pace with the rise in real wages, AFDC payments rose only half as much. And not only are AFDC benefits lower than those paid to other groups receiving public assistance, but few of the recipients received any rehabilitation services. In 1961, only 7 percent of the families receiving AFDC were offered any opportunity to obtain vocational education or rehabilitation services. This situation will hopefully be remedied by the diverse programs initiated under the Economic Opportunity Act.

In light of the characteristics of AFDC recipients, Burns' evaluation of the program is succinct:

> The miserable pittances that we dole out to the average assistance recipient, and ironically, the most miserable of all are the families which by definition contain the citizens of the future . . . these pittances, are not calculated to enhance self-respect, normal participation in community life, and a spirit of enterprise among the young.[7]

Veterans' Pensions

One large group of our population is singled out by existing legislation for preferential income support in case of want. This group is the 22 million veterans and their families. While present programs may not be adequate to permit all veterans and their dependents to escape poverty, major steps have already been taken to provide basic needs, particularly for older veterans and dependent survivors of deceased veterans.

Veterans' benefits are as old as the Nation, the first veteran pension law having been passed in 1776. The present law provides two types of cash benefits—compensation and pensions. Compensation is paid to veterans who incurred an injury or disability while serving in the armed services. Pensions are paid to veterans who served in the armed forces during wartime, whose annual income is below a specified level, and who are permanently and totally disabled. In practice, the disability qualifications are relaxed as the veteran advances in age. Qualifications are stringent below the age of 55, but veterans aged 65 and over may qualify for a pension essentially on the basis of need.

One of every 10 war veterans in 1964 received compensation for service-connected disabilities, at a total cost of $1.7 billion. Annual compensation for veterans averaged $841, but ranged from $240 to $3,000 for total disability with additional benefits paid to veterans who suffered total blindness, deafness, or loss of limbs. Average annual compensation costs are likely to increase even in the absence of a rise in benefits since service-connected disabilities tend to be aggravated with advancing age. In 1964, 4 of every 10 World War II veterans qualified for only minimum disability (10 percent impairment) benefits, compared with 1 of every 7 World War I veterans. At the other extreme, 14 percent of World War I veterans were afflicted with total disability, compared with 4 percent of World War II veterans. Because of the greater degree of impairment among older veterans, average annual compensation of World War I veterans was $1,320, about two-thirds higher than the compensation of World War II veterans. In 1965, compensation benefits were raised by 10 percent.

Data are not available on the income level of veterans qualified to receive service-connected compensation. But many of them undoubtedly would have been counted among the poor had they not received compensation. This is particularly true of the nearly 400,000 (out of a total of 2 million) whose degree of impairment was 50 percent or higher. It is likely that many of these disabled veterans were not able to hold full-time jobs.

A total of 1.2 million war veterans received $1.1 billion in pensions in 1964, at an average of $945 for the year. These pensions were paid under two separate systems. Prior to July 1, 1960, veterans who were married or had minor dependents qualified for pensions if their total annual income was less than $2,700. The income limitation for nonmarried veterans was $1,400. The annual pension of a veteran under age 65 was $794. This amount was increased in 1960 to $946 after 10 years of entitlement or at age 65. Blind veterans and those who need regular aid and attendance receive an annual benefit of $1,625.

In 1960, Congress added a sliding scale of benefits based on the beneficiary's level of income. The new law provided the annual benefits shown in table 2.

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[6] M. Elaine Burgess and Daniel O. Price, *An American Dependency Challenge* (Chicago American Public Welfare Association, 1963), p. 108.

[7] Burns, *op. cit.*, p. 5.

TABLE 2. VETERANS' BENEFITS BASED ON INCOME LEVEL AS OF 1960

Annual counted income	Annual pension	
	Veteran	Widow
Veteran or widow without dependents:		
Less than $600	$1,200	$768.
$600 to $1,200	$900	$576.
$1,200 to $1,800	$516	$324.
Veteran or widow with dependents:		
Less than $1,000	$1,200 plus $60 for each dependent (maximum of $1,380).	$960 (one child) plus $180 for each additional child.
$1,000 to $2,000	$960	$768 (one child) plus $180 for each additional child.
$2,000 to $3,000	$576	$516 (one child) plus $180 for each additional child.

Veterans or their survivors who qualified for pensions prior to the enactment of the 1960 law could retain the old level of benefits. The sliding scale of benefits adopted in 1960 for newly qualified recipients reduces the pensions paid to relatively more affluent veterans but still permits certain arbitrary inequities. For example, a single veteran with an annual income of $500 is entitled to a $1,200 annual pension, giving him a combined income of $1,700, while a veteran with an annual income of $700 receives a pension of $900, for a combined income of $1,600. Perhaps this suggests the desirability of refining the sliding pension scale, or of adopting a system similar to that used under OASDI whereby the annuity is adjusted on the basis of the recipient's earnings. For earnings above $1,500 a year, the OASDI beneficiary loses $1 in benefits for every $2 in earnings.

A married veteran may qualify for a pension even if his total annual family income is above the prescribed limit because the wife's earned income is not counted, except where she also receives unearned income. In that case the first $1,200 of the wife's annual income is still excluded for purposes of qualifying for a pension. Data are not available on the amount of income received by pensioners' wives, but about a quarter of total pension benefits are paid to veterans whose spouses have some income. Homeownership is not counted as income, and 10 percent of OASDI benefits are also exempt from the income limitations. A veteran receiving a pension may also own considerable assets—the amount has never been stated by the Veterans Administration.

Since most veterans receiving pensions are 65 years or over, they are also eligible to receive OASDI benefits. It can be assumed, therefore, that poverty has been eliminated among aged veterans. A 1964 study by the Veterans Administration has indicated that only 3 of every 10 veterans with dependents had an annual income of less than $1,000, and these veterans were entitled to draw at least an additional $1,260 in pensions. Less than 4 of every 10 veterans without dependents who had an income of less than $600 were entitled to draw $1,200 in benefits.[8]

Widows and dependent children of deceased war veterans also qualify for pensions. Although the same income limitations apply to widows as to veterans in qualifying for pensions, the amount of the benefit is reduced for widows. As in the case of veterans, the maximum benefits paid to widows and children of veterans under the 1960 legislation are greater than the uniform benefits paid under prior law, but the eligibility requirements under the two pension systems apply to different income limitations.

Children of deceased veterans also qualify to receive pensions, even when their mother's income is too high to qualify her for a pension or when she is deceased. The annual rate of the pension for one child is $456; another $180 is paid for each additional child, the total amount being equally divided among the children. The benefits are paid to children until they reach age 18, though they continue for four more years if the beneficiary remains in school. A veteran's child is ineligible to receive a pension if the child's annual unearned income, excluding wages, exceeds $1,800, or if the estate is large enough to support the child.

In 1964, 1.3 million widows and children of nearly 900,000 deceased veterans qualified for pensions. About half of the beneficiaries were dependents of World War II veterans. During the last few years, the dependents of about 40,000 deceased World War II veterans qualified annually to receive pensions. If the present law continues, the number of dependents of World War II veterans qualifying for pensions will continue to rise as the mortality rate of the veterans increases.

In 1965, there were about 18 million married veterans with 33 million children in the United States. Since most veterans' widows with children also now qualify to receive OASDI benefits, the combined potential income of veterans' survivors has in most cases eliminated poverty for these families.

Administration of Assistance

Veterans' pensions are more generous than public assistance payments (except in the case of surviving dependent children), and they are provided with due consideration for the dignity and self-respect of the beneficiaries. The detailed checks and continued justifications of expenditures so common in the case of public assistance are not used in administering veterans' pensions. All a veteran has to do to qualify for a pension, provided he can prove eligibility, is to file a relatively simple form. Thereafter he is required to submit annually information needed by the Veterans Administration to keep his claim active. The annual data are filed on a simple card (reproduced here) and include information about the veteran's assets, income, and dependents eligible to receive benefits.

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[8] U.S. Congress, House, Committee on Veterans Affairs, Hearings, 88th Cong., 2d sess., *Pension Bills Providing Non-Service-Connected Pensions* (Washington: U.S. Government Printing Office, 1964), pp. 3872–3881.

Once eligibility is established, the Veterans Administration makes only a cursory check of claims. The General Accounting Office has criticized the Veterans Administration for laxity in verifying claims, stating that VA offices spend an average of only 4 minutes in verifying each pension claim. The Veterans Administration has insisted that it makes spot checks with the Internal Revenue Service in cases of questionable claims, and that sample comparisons of income reported on pension claims with social security records have shown that only 0.3 percent of the claimants were ineligible to receive pensions on the basis of income.[9]

Without entering into the merits of the controversy between the General Accounting Office and the Veterans Administration, it would appear that administrators of public assistance might do well to study VA methods of paying claims. Even assuming that claims verification in the Veterans Administration is rather lax, it would be a relatively simple task in these days of computerized records to check income received by public assistance claimants. The VA experience indicates, as a perceptive social worker has observed, that "a means test does not have to be mean." In contrast to the simple procedures used by VA, public assistance agencies subject recipients to indignities and require their caseworkers to spend their time on recordkeeping at the price of providing any meaningful help to their clients. According to an official publication of the U.S. Department of Health, Education, and Welfare:

> . . . Public assistance fails to help many families; . . . it merely perpetuates their poverty. . . .
>
> In some States, . . . welfare workers must spend virtually all of their time verifying proofs that each family meets many eligibilty requirements. . . . Elaborate budgets, which must be frequently recomputed, also create paperwork that keeps the welfare worker from his real job of providing helpful service. . . .[10]

Programs for the Poor in the Work Force

"Give a man a fish," an old proverb moralizes, "and you feed him for a day. Teach him to catch a fish and you feed him for life." This maxim is an apt text for the Great Society's war on poverty. The current emphasis in the war on poverty is providing opportunity rather than mere subsistence for the poor. The underlying assumption is that in our highly productive economy there are places for all who are properly motivated and well equipped to participate in the world of work. The problem of the poor, according to this reasoning, is that they are isolated from the mainstream of American life. The Council of Economic Advisers, which sounded the Great Society's trumpet call of the war on poverty, stated:

> The poor inhabit . . . a world apart . . . where Americans are literally concerned with day-to-day survival . . . where pride and privacy must be sacrificed to get help, where honesty can become a luxury and ambition a myth. Worst of all, poverty of the fathers is visited upon the children.[11]

As the Council recognized, this analysis implied a multipronged attack upon the causes of poverty and not merely its symptoms. For the poor in the work force, this means adapting existing institutions so that they can minister to the special needs of the poor—that is, equip them with skills needed in the free labor market; provide them with jobs when none exist under free market conditions; induce private industry to bring jobs to unemployed workers stranded in depressed areas; and assure workers adequate earnings above the threshold of poverty.

Labor Market Services

An examination of existing public labor market operations indicates, regrettably, that despite some improvements in recent years they are not geared to minister to the special needs of many of the poor and disadvantaged. Statistics of the U.S. Employment Service (USES) and affiliated State agencies are not available in sufficient detail to develop a comprehensive picture of their services to poverty groups. Whatever the record of the public Employment Service in placing the poorly educated and unskilled, its services are necessarily responsive to the needs of employers who naturally tend to seek the best qualified employees to fill existing job vacancies.

Thus, the USES has devised techniques to select the most qualified applicants. The General Aptitude Test Battery (GATB), given to nearly one of every four applicants for nonfarm placement, is designed to screen and test the literate. But unfortunately, the vast majority of the unemployed poor have a limited education, and many are illiterate. In 1963, 15 percent of all family heads had less than 8 years' education, but they accounted for 36 percent of all families with an annual income of less than $3,000. The USES has recognized that, if it is to provide for the needs of this group, it will have to adopt new techniques. In recognition of this fact, the Employment Service recently developed a nonreading measure of general learning ability. This nonreading test is de-

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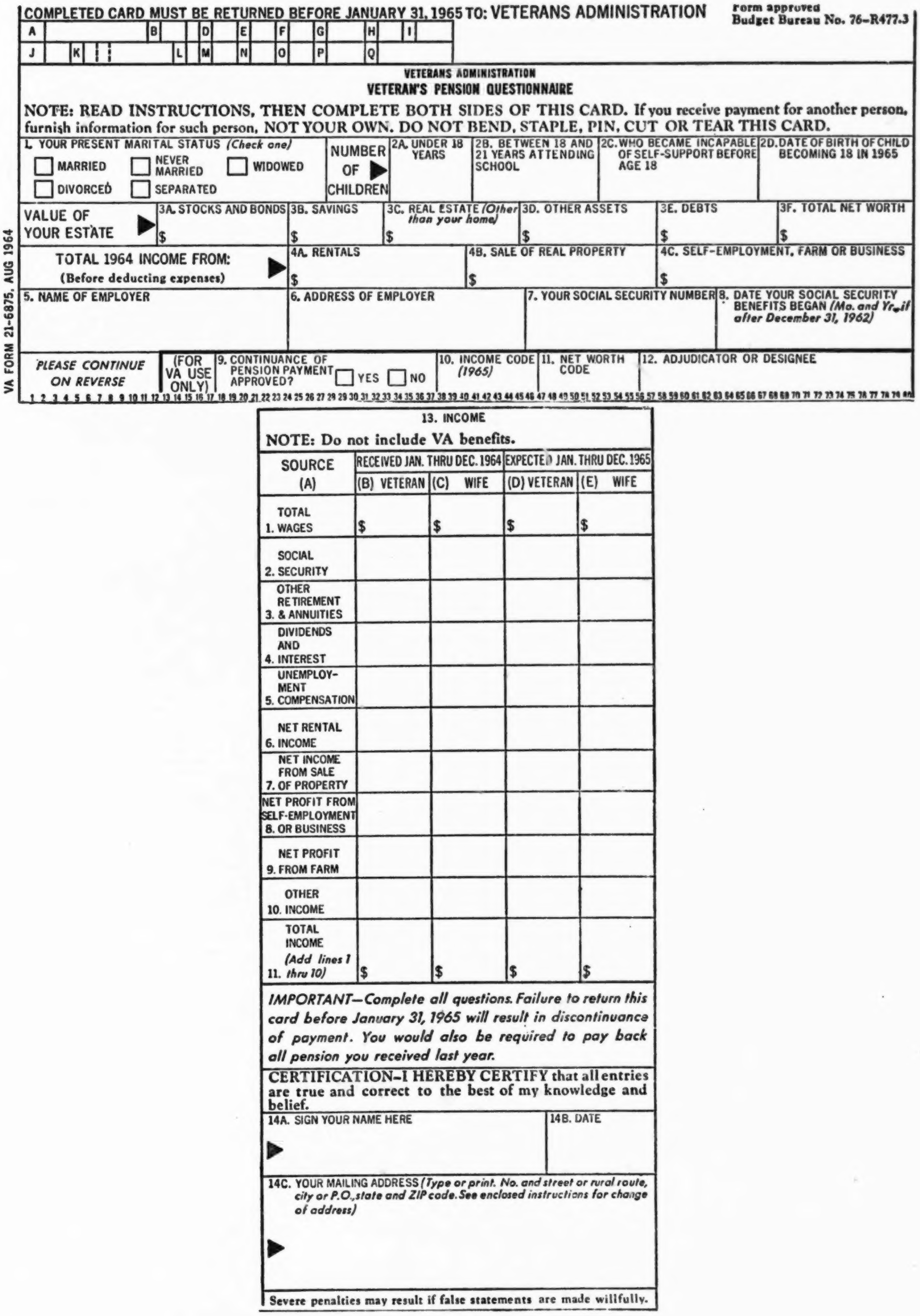
[9] The Comptroller General of the United States, "Review of Selected Operations of the Compensation and Pension Program, Veterans Administration," June 1960, p. 50.

[10] U.S. Department of Health, Education, and Welfare, *A Constructive Public Welfare Program* (Washington: U.S. Government Printing Office, 1965), p. 22.

[11] *The Economic Report of the President* (Washington: U.S. Government Printing Office, January 1964), p. 55.



COMPLETED CARD MUST BE RETURNED BEFORE JANUARY 31, 1965 TO: VETERANS ADMINISTRATION

Form approved
Budget Bureau No. 76-R477.3

A	B	D	E	F	G	H	I		
J	K	L	M	N	O	P	Q		

VETERANS ADMINISTRATION
VETERAN'S PENSION QUESTIONNAIRE

NOTE: READ INSTRUCTIONS, THEN COMPLETE BOTH SIDES OF THIS CARD. If you receive payment for another person, furnish information for such person, NOT YOUR OWN. DO NOT BEND, STAPLE, PIN, CUT OR TEAR THIS CARD.

1. YOUR PRESENT MARITAL STATUS *(Check one)*
☐ MARRIED ☐ NEVER MARRIED ☐ WIDOWED
☐ DIVORCED ☐ SEPARATED

NUMBER OF CHILDREN ▶ 2A. UNDER 18 YEARS | 2B. BETWEEN 18 AND 21 YEARS ATTENDING SCHOOL | 2C. WHO BECAME INCAPABLE OF SELF-SUPPORT BEFORE AGE 18 | 2D. DATE OF BIRTH OF CHILD BECOMING 18 IN 1965

VALUE OF YOUR ESTATE ▶ 3A. STOCKS AND BONDS $ | 3B. SAVINGS $ | 3C. REAL ESTATE *(Other than your home)* $ | 3D. OTHER ASSETS $ | 3E. DEBTS $ | 3F. TOTAL NET WORTH $

TOTAL 1964 INCOME FROM: (Before deducting expenses) ▶ 4A. RENTALS $ | 4B. SALE OF REAL PROPERTY $ | 4C. SELF-EMPLOYMENT, FARM OR BUSINESS $

5. NAME OF EMPLOYER | 6. ADDRESS OF EMPLOYER | 7. YOUR SOCIAL SECURITY NUMBER | 8. DATE YOUR SOCIAL SECURITY BENEFITS BEGAN *(Mo. and Yr., if after December 31, 1962)*

PLEASE CONTINUE ON REVERSE | (FOR VA USE ONLY) | 9. CONTINUANCE OF PENSION PAYMENT APPROVED? ☐ YES ☐ NO | 10. INCOME CODE *(1965)* | 11. NET WORTH CODE | 12. ADJUDICATOR OR DESIGNEE

VA FORM 21-6875, AUG 1964

13. INCOME

NOTE: Do not include VA benefits.

SOURCE (A)	RECEIVED JAN. THRU DEC. 1964		EXPECTED JAN. THRU DEC. 1965	
	(B) VETERAN	(C) WIFE	(D) VETERAN	(E) WIFE
1. TOTAL WAGES	$	$	$	$
2. SOCIAL SECURITY				
3. OTHER RETIREMENT & ANNUITIES				
4. DIVIDENDS AND INTEREST				
5. UNEMPLOYMENT COMPENSATION				
6. NET RENTAL INCOME				
7. NET INCOME FROM SALE OF PROPERTY				
8. NET PROFIT FROM SELF-EMPLOYMENT OR BUSINESS				
9. NET PROFIT FROM FARM				
10. OTHER INCOME				
11. TOTAL INCOME *(Add lines 1 thru 10)*	$	$	$	$

IMPORTANT—Complete all questions. Failure to return this card before January 31, 1965 will result in discontinuance of payment. You would also be required to pay back all pension you received last year.

CERTIFICATION—I HEREBY CERTIFY that all entries are true and correct to the best of my knowledge and belief.

14A. SIGN YOUR NAME HERE ▶ | 14B. DATE

14C. YOUR MAILING ADDRESS *(Type or print. No. and street or rural route, city or P.O., state and ZIP code. See enclosed instructions for change of address)*
▶

Severe penalties may result if false statements are made willfully.

signed to determine whether low scores of certain individuals reflect limited ability, inadequate reading ability, or cultural limitations. In addition, research is underway to develop a nonreading edition of all nine GATB aptitudes.

To serve more adequately the illiterate and poorly educated, the public Employment Service needs to expand its functions and activities. Since providing special services to disadvantaged workers is costly, it would naturally lead to the neglect of other unemployed workers unless Congress allocates additional funds to the USES for this purpose. Of course, expansion of services to the disadvantaged by the USES must not be achieved at the cost of neglecting its regular functions.

Important steps have been taken recently to expand the services to disadvantaged youth by the establishment of some 60 Youth Opportunity Centers operated by the public Employment Service, and the number of these centers is scheduled to double. These Youth Opportunity Centers offer special counseling, testing, and placement services to improve the employment prospects of youths who are poorly equipped to compete for jobs in the open market. A total of $30 million has been appropriated in fiscal year 1966 for the operation of these centers and the expansion of other services to youth, including special assistance for selective service rejectees.

The experience of vocational rehabilitation programs provides ample justification for improving the quality of placement and related services for highly disadvantaged workers. The average expenditure for each of the 135,000 vocational rehabilitation cases in fiscal 1965 was about $1,200. New legislation in the fall of 1965 substantially expanded Federal grants for vocational rehabilitation, raising the Federal share of grants to 75 percent of costs (from the previous range of 50 to 70 percent, depending upon the State's per capita income) and boosting annual Federal authorized expenditures to $400 million by 1968. Such a large investment is justified on economic grounds. The mean earnings of vocational rehabilitants, while meager, jumped fivefold in 1964—from $8 to $42 per week. In his study of vocational rehabilitation programs, Ronald Conley concludes:

> . . . Many disabled can be treated, retrained, and returned to gainful activity. The rehabilitation program has done this for hundreds of thousands. The costs of the program appear to have been repaid many times over, both to society, as a whole, and to the taxpayers who bore the costs of rehabilitation.[13]

The USES does not publish nationwide statistics on educational attainment or other relevant characteristics of employees served by affiliated State employment offices. Such data are available, however, for trainees selected under the Manpower Development and Training Act. These statistics show that more than half of the MDTA trainees during 1964 had completed at least a high school education, while only a third of the unemployed had attained a comparable educational level. On the other hand, only 1 of every 14 MDTA trainees had completed less than 8 years of education, compared to 1 of every 5 unemployed.

In 1963, Congress recognized the special needs of uneducated and unemployed workers by adding basic education to the vocational course for those who lacked a rudimentary education, and by extending the maximum training period for these students from 52 weeks to 72 weeks. In 1965, the maximum duration of training was extended to 2 years. Officials in charge of MDTA apparently found it difficult to develop adequate training techniques which would serve the least educated, for by the end of 1964 only about 2 percent of the MDTA trainees were selected for experimental and demonstration projects designed to help poorly educated unemployed workers. Whether MDTA training can be adapted to equip large numbers of these persons to fill existing job vacancies in the future remains in doubt.

Job Creation and Work Relief

The New Deal placed major reliance on two programs—public works and work relief—for income maintenance of the unemployed and impoverished. The former program, designed to fulfill needed public facilities, relied on normal market processes under which the Government contracted with private enterprise to construct the facilities. Work relief, on the other hand, emphasized job creation; considerations of labor efficiency and project need were secondary. In both cases, the workers were paid wages prevailing in the local labor market. These programs, whose total cost amounted to $17 billion, remained in effect as long as mass unemployment prevailed, tapered off sharply after Pearl Harbor, and were abandoned completely shortly thereafter when full employment conditions were achieved in the wartime economy.

The current war on poverty places little emphasis upon job creation, except for unemployed and impoverished youth. The 1962 amendments to the Social Security Act, while presumably designed to rehabilitate relief recipients, remained largely an exhortation as far as providing work to recipients of assistance, even though a number of States and communities conducted some projects providing work to reliefers. During 1964, about 9,000 AF DC recipients found employment following participation in public assistance work and training programs. The Economic Opportunity Act provides expanded work or training programs for unemployed parents (especially fathers) whose families are on relief rolls. It was estimated in 1964 that 130,000 relief recipients were available for work, if jobs could be found for them. A total of $112 million was allocated in fiscal 1965 to provide work relief—or work experience, according to the current euphemism—to aid 89,000 relief recipients. The program started slowly, yet by June 30, 1965, 16,000 persons had actually gained employment. Meanwhile, the Department of Health, Education, and Welfare, which administers the program, had signed contracts to provide work experience for another 73,000 persons.

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[13] Ronald Conley, *The Economics of Vocational Rehabilitation* (Baltimore: The Johns Hopkins Press, 1965), chap. 1, p. 2.

Initially, the program offered no monetary inducements to participants and limited their earnings to the benefits that they were entitled to receive under the relief program. Beginning in July 1965, however, persons selected for work experience became entitled to receive 100 percent of the basic needs. As mentioned earlier, the majority of the States pay AFDC receipients less than 100 percent of their total basic needs.

The work experience projects provide funds for special services, such as literacy training, guidance, counseling, and remedial medical treatment, in addition to the work experience, to help rehabilitate the relief recipients.

The 1965 amendments to the Economic Opportunity Act expanded the scope of the work experience program by including workers in farm families with an income of less than $1,200. A total of $150 million was authorized to be expended during fiscal 1966.

Current appropriations allow only a small proportion of AFDC recipients to participate in the work experience program. It was recognized that the bulk of AFDC recipients could not benefit from this program because many AFDC mothers were either unemployable or fully occupied with home responsibilities. In some cases day-care facilities might be provided to free a greater number of mothers for work. Some experts might argue, however, that it would be wiser as a matter of public policy to permit a mother to devote all her energies to the rearing of her children, rather than work at what is most likely to be a low-paying and unskilled job.

The Economic Opportunity Act has been more generous in providing employment opportunities for youth. In fiscal 1965, a total of $379 million was appropriated for youth employment programs, divided as follows: $190 million for Job Corps, $132 million for Neighborhood Youth Corps, and the balance for college work-study programs. The expenditures allocated for these programs in 1966 are $554 million.

It would be a mistake to equate youth unemployment with poverty. While youth unemployment in 1964 averaged 800,000, the median income for their families exceeded $6,400. However, about 300,000 unemployed teenagers and an additional 150,000 out-of-school youths, not seeking work, were members of families with an annual income of less than $5,000, and half of these were families with an annual income of less than $3,000. Data are not available about the size of these families, but by applying the official Government poverty criteria presented earlier in this study, it might be estimated that about 300,000 of these youths were members of impoverished families.

The above data apply to teenagers only. It would be reasonable to assume that 20- and 21-year-old youths who also qualify for assistance under the Federal youth employment programs would raise the number of eligible youths to about 500,000, excluding underemployed youths who may double the number. Under current appropriations, therefore, when the youth programs under the Economic Opportunity Act are fully effective, together with the MDTA youth training programs and Vocational Education Act programs, employment or training will be provided for less than half of the impoverished youths aged 21 or less who need gainful employment, excluding, again, the underemployed. By August 1965, the Neighborhood Youth Corps (NYC) had provided employment for 250,000 youths, and 12,000 others had been enrolled in the Job Corps. But NYC will not have adequate funds to sustain the August employment level for the rest of the year. The average number of jobs that the program will support is not likely to exceed 150,000. The Job Corps, MDTA, and vocational education programs might provide training or jobs for 75,000 youths during the current fiscal year.

As in the case of the work experience programs for adults, the youth employment programs under the Economic Opportunity Act are still too limited for a meaningful assessment. However, two basic issues have been raised concerning the antipoverty youth programs.

The first issue deals with allocation of funds. It is estimated that the cost to the Government per youth in the Job Corps is about five or six times higher than in the Neighborhood Youth Corps. It has been suggested, therefore, that the limited funds available should be allocated to the Neighborhood Youth Corps in preference to the Job Corps. Advocates of the Job Corps argue that rehabilitating some youths from impoverished families requires that they be uprooted from their present unwholesome environment—a requirement which can be accomplished only through Job Corps camps. It has also been maintained that a successful program must provide appropriate educational facilities, guidance, counseling, and medical and other services. It is thus hoped that this more "costly" program will pay off in the long run, not only to the rehabilitated individuals but also to society in terms of reduced police and even prison costs.

The second issue relates to the appropriate pay scale for Neighborhood Youth Corps selectees. Under current programs, trainees receive $1.25 per hour. This means that a youth attending school and selected for 15 hours of employment per week with the Neighborhood Youth Corps will receive almost as much as an MDTA youth trainee for 40 hours of training, since the maximum MDTA allowance for a youth is $20 per week. It may be argued that the more liberal allowances under the NYC will encourage a youth to continue in school. However, on work provided under the Vocational Education Act, pay scales are even lower than MDTA allowances and may not exceed $45 a month or $350 during an academic year. An out-of-school selectee for the Neighborhood Youth Corps could receive twice as much pay as the MDTA trainee. Such pay scales may provide an overriding incentive for youths with short-run horizons to forgo more promising MDTA or vocational school training in order to compete for Neighborhood Youth Corps jobs which normally will not lead to the acquisition of any particular skills. This situation may be aggravated in low-wage areas, where the Neighborhood Youth Corps allowance would sometimes be in excess of wages paid in low-wage private industry. Again this situation may induce youths to hold Neighborhood Youth Corps jobs as long as possible rather than to seek private employment; because of this, a number of communities have refused to participate in NYC programs. Since it is expected that Neighborhood Youth Corps applicants will exceed the number of jobs that the program can provide under current funds, it has been further suggested that lower wages would enable the program to serve more youths. Advocates of the present policy argue that if unemployed disadvantaged youths are to be provided an incentive to work, an hourly rate of $1.25 is not too high to establish proper work habits. In addition, it is argued that any "extra" income paid to NYC participants is wisely spent because it provides income maintenance to impoverished families.

Appalachian and Depressed Area Programs

Unemployment and underemployment are major contributors to poverty and deprivation in the United States. It appears reasonable, therefore, to consider as a part of the antipoverty program the Federal measures to aid depressed areas where unemployment is more widespread and spells of unemployment are of longer duration than in other areas. But an examination of the Appalachian Regional Development Act, the Area Redevelopment Act and its successor—the Public Works and Economic Development Act—raises considerable doubt about their effectiveness as tools in fighting poverty. This is not to say that regional and area economic rehabilitation programs may not be justified on other grounds; but they have limited applicability in reducing poverty, at least in the short run.

Signed into law by President Johnson in March 1965, the Appalachian Regional Development Act has not had time to have any visible effect upon the area. One can, therefore, only speculate about the impact that this legislation may have upon the reduction of poverty in Appalachia which comprises 368 counties in 12 States stretching from New York to Alabama and includes more than 17 million people.

The assumption underlying the program is that the economic distress of the region is due to its relative isolation. Therefore, nearly four-fifths of the $1,092 million total authorized expenditure is allocated for the construction of roads. The balance is to be spent for increasing the Federal share in grant programs; for the establishment of medical facilities to provide diagnostic care and treatment; and for resource development and planning, including the improvement of vocational training.

It is estimated that unskilled workers might qualify for no more than a fifth of the total man-hours generated directly by construction projects. Considering the extent of union control over labor markets in public works, it is probable that only a small proportion of the work will go to impoverished unemployed workers. The unions might relax their barriers to new members for massive public construction if jobs were plentiful; but the Appalachian and related area programs are not large enough to create widespread shortages of union workers, particularly since the construction work is taking place in areas of high unemployment.

Not before the projects are completed—assuming that the hopes of the act's sponsors prove to be well founded—will the influx of tourist facilities and other economic activity begin to generate large numbers of jobs for unskilled workers. These jobs will, of course, improve the economic position of the unemployed poor, but many will be seasonal and low paying, and may still not allow the workers to escape the threshold of poverty.

The Federal depressed area program is an equally limited tool for combating poverty. It follows essentially a trickledown approach in providing incentives for businessmen to locate or expand enterprises in depressed areas. Directing its aid to employers and not to the unemployed, the program is based on the belief that Federal efforts should concentrate on the business community which, in turn, will create new jobs to help the unemployed.

An objective evaluation of Area Redevelopment Act accomplishments is difficult. Since ARA had scattered its resources over hundreds of areas, it is difficult to measure the impact of the nearly $300 million the agency committed for investment in designated areas. Working from estimates prepared by their clients, ARA officials anticipated that some 71,000 jobs will have been created in depressed areas when all approved projects are fully operative. While the addition of 71,000 direct jobs within less than 4 years would be no mean accomplishment, the validity and meaning of the official data are open to serious question. ARA backed many marginal projects; and available information on high mortality of new businesses, much less marginal enterprises, suggests that a considerable proportion of ARA-backed projects will go sour before too long. In fact, some already have. It would hardly be surprising, therefore, if the job-creation projection based on applicants' anticipations may turn out to be overenthusiastic.

Nor should it be assumed that none of the ARA-backed projects would have succeeded without Government help. ARA claimed "credit" for all jobs generated on projects it supported, while contributing about one-third of the total investment in these enterprises. No doubt, a great many of these projects would not have started without ARA help. It's the old story—for want of a nail, a kingdom was lost. But we must assume that the reverse is also true—that many a nail might be lost without having the slightest impact upon the progress of the kingdom. It is reasonable to assume that some of these enterprises might have received needed financial support from other sources.

While the total employment generated by ARA is a matter of speculation, available data do suggest that a significant proportion of the work force on ARA-backed projects had been either unemployed or not in the labor force just previous to that employment. William H. Miernyk, of West Virginia University, has studied the employment background of 1,262 employees in 33 ARA-supported enterprises, mostly in the Northeast and in the Great Lakes States. He found that nearly two-thirds of the employees in the 33 establishments were not working when they applied for a job, and that an additional 11 percent were employed on part-time basis. The study also showed that nearly half of the employees reported higher hourly earnings than they had received in their previous full-time jobs. While some of these workers may have been members of impoverished families, the Miernyk study regrettably does not contain any information concerning their economic status prior to obtaining their jobs. However, an examination of other characteristics of Miernyk's sample suggests that these workers were not typically in the poverty classification. More than half of the employees were members of families with more than one earner, and three of every five had at least a high school education. The high proportion of multiple earners and the relatively high educational attainment of the workers are not characteristics commonly found among impoverished families. Only 10 percent of heads of families in the Nation with a high school education had an income less than $3,000 during 1964 and only one of every four poor families had multiple earners. The extent to which these data are applicable to Appalachia is not known.

The Public Works and Economic Development Act (EDA) is a much broader program than the Area Redevelopment Act which it replaced in August 1965. The newer law authorizes annual expenditures of $760 million to aid depressed areas, compared with $393 million over a 4-year period provided by the previous legislation; but for fiscal year 1966 the administration requested that only half of the total authorized expenditures be appropriated, and Congress cut the amount to be expended during the year to $332 million.

Focusing on the development of public facilities, the newer legislation authorizes $500 million in annual grants for public works which would directly or indirectly improve employment opportunities in depressed areas, "or primarily benefit the long-term unemployed and members of low-income families or otherwise substantially further the objectives of the Economic Opportunity Act of 1964. . . ." The Federal grants may vary from 50 to 80 percent of total cost of any given project. It is not clear how the new depressed area measure will be coordinated with the Public Works and Economic Opportunity Act or how the public works program will aid the impoverished. Allocating a specific share of the public works funds for projects where unskilled labor can be utilized—projects such as the clearing of streams, construction of fire trails, reforestation, and urban park development—would directly aid the unemployed poor. But it could hardly be claimed that such projects would be the most efficient utilization of resources to help depressed areas "achieve lasting improvement by the establishment of stable and diversified local economies"—a major objective of the legislation. The other major provisions of the EDA are also essentially an expanded version of old ARA programs and apply to nearly the same areas.

Diverse and frequently interrelated factors account for the higher incidence of poverty in depressed areas compared with more affluent communities and regions in the United States. Declining employment opportunities and the associated economic influences of outmigration, the lower level of educational attainment, the lack of jobs for potential secondary family wage earners, differences in industry mix, higher rate of unemployment, larger proportion of farm population, and the general underdeveloped state of some depressed areas account for a lower level of income in these areas. A study of ARA-designated areas showed that in 1959 their average per capita income was more than a fourth lower than that of the rest of the country. Thus, poverty was more widespread in these regions. Economic growth and expansion should, therefore, tend to reduce the extent of poverty in depressed areas.

Unemployment Insurance

The object of the unemployment insurance program is to provide essential aid, during periods of forced idleness, to unemployed workers who have substantial recent attachment to the labor force. It limits the income plunge of those who become unemployed and minimizes or staves off poverty for many. Reasonable people may disagree as to the proper level or duration of benefits. But it can hardly be argued that the unemployment insurance system should be altered markedly to serve as a major means of income support for the poor.

In most States, unemployment insurance makes up less than half of the net wage loss (take-home pay) of those forced into idleness, but many workers are not covered by the system or exhaust their benefits before they regain employment. Half of the 9.5 million persons who were unemployed for 5 weeks or longer during 1962 did not receive any unemployment insurance benefits. Available evidence suggests that unemployment insurance serves those who are classified as poor to a lesser extent than other unemployed. About 15 million workers are not currently protected by unemployment insurance, including more than 6 million employed in those categories where the working poor tend to concentrate—agriculture, domestic service, and small firms with three or fewer workers. On the other hand, nearly half the States use a benefit formula weighted in favor of low-wage earners, and 12 States pay additional benefits for dependents.

Aside from the restricted coverage, it would appear that unemployment benefits have a limited applicability to many of the poor. A person receiving unemployment benefits must have a recent history of work and be currently available for work in order to collect benefits. A large percentage of the idle poor are not available for work because of disability, illness, or home responsibilities. Moreover, to qualify for unemployment insurance a worker must earn a minimum of wages or be employed in a covered industry for a minimum of about 15 weeks (the exact minimum earnings and duration of employment vary from State to State). The repeated spells of unemployment which the poor experience would normally entitle them to only the most temporary relief, if indeed they would qualify at all.

Current proposals to extend unemployment benefits to 39 or 52 weeks from the normal prevailing 26 weeks would probably have only limited applicability to the poor, though the added benefits may prevent some long-term unemployed from falling below the poverty line. These proposals would restrict the extended duration of benefits to unemployed persons with considerable past work experience. The Johnson Administration plan for extended benefits, financed jointly by employers and the Federal Government, would be limited to workers with at least 78 weeks of employment during the preceding 3 years. Many of the poor do not have such a work record.

Whatever the merits of current proposals to raise unemployment benefits and extend their duration, they can hardly be justified on the ground that they would substantially combat the current prevalence of poverty. Probably an extension of coverage, particularly to domestic and agricultural workers, would have a greater impact for the poor. The Johnson Administration proposals to extend unemployment insurance coverage would apply to about 40 percent of all agricultural workers. Whether Congress will adopt this proposal cannot be foretold.

Minimum Wages

The image of the destitute, idling through life on relief or eking out a living from old-age receipts, is only partially correct. As noted earlier, the fact is that a substantial number of those living below the threshold of poverty are actually fully employed. About half of the 7.2 million impoverished household heads in 1963 were in the work force, including 2 million heads of families who worked full time during the entire year. Another 1.6 million family heads worked on part-time or full-time jobs during part of the year.

More than 10 million jobs in the United States currently pay less than $1.50 an hour. These jobs, although most typically found in trade and service industries, are widespread throughout our economy. The majority of the low-paying jobs are held by youngsters who have just entered the work force or by women who are supplementing family incomes. But for the 2 million family heads (95 percent males), low-paying jobs represent not starting wages but a way of life. And 5.7 million children were being raised by these working poor who were fully employed during 1963. A quarter of the 7.2 million impoverished families had more than one earner, but even multiple breadwinners are not enough to pull them above the poverty threshold. Almost a third of the families are Negro. In addition, one-eighth of the 5 million poor persons living alone also worked full time in 1963 but earned less than $1,500.

It is quite apparent that present wage levels are inadequate to permit millions of steady workers, particularly those with large families, to escape poverty. Yet the elimination of substandard wages was one of the basic goals of the New Deal and was expressed in the Fair Labor Standards Act of 1938.

The objective of the Fair Labor Standards Act is to achieve as rapidly as practicable minimum wage levels that will maintain the health, efficiency, and general well-being of workers. Congress was understandably concerned that an unduly high minimum wage might price many low-productivity jobs out of existence. Applying the reasonable assumption that a low-paying job is better than no job at all, Congress thus provided that minimum wages should not be so high as to curtail employment and earning power substantially.

In part to achieve these dual but frequently conflicting objectives, Congress has acted cautiously in applying the law over the years. It has established minimum wages which directly affect only a limited number of employees at the bottom of the economic ladder. Only 3 of every 5 nongovernmental wage and salary earners are covered; excluded from protection are the bulk of workers in the lowest paid industries, including those engaged in service, trade, and all farm and domestic workers (chart 4).

Congress has, nevertheless, raised the statutory minimum wage rate on three occasions since the end of World War II, and the rise in minimum wages has more than kept pace with the increase in average wages of American industry. The current minimum hourly rate on jobs covered by the Federal minimum wage law is $1.25. Under the prodding of President Kennedy, Congress in 1961 took the first step to extend protection of minimum wages. Brought under minimum wage protection that year were some 3.7 million employees, mostly in retail and service industries, and these employees comprised about a fourth of all workers in these industries. The House Education and Labor Committee, in September 1965, approved a bill to expand coverage to 6 million additional workers engaged in retail, service, and agricultural enterprises and to raise wages of those previously covered to $1.75 by 1968. Action on the proposed legislation has been deferred to 1966.

In addition, a number of States have enacted minimum wage laws for employees not affected by the Federal legislation. Under these laws, which cover some 5 million employees in 34 States, minimum hourly rates range from 16 cents in Arkansas (originally enacted in 1915) to $1.75 in Alaska; in 12 of these States the minimum wage is $1.25 or higher.

Since low wages are a major factor accounting for poverty, the role of minimum wages in the war against poverty has been a matter of debate. Would it be feasible to speed up increases in minimum wages and extension of coverage? There is no doubt that existing minimum wage legislation has succeeded in raising the earnings of millions of workers. The last boost in Federal minimum wages, raising hourly rates in two stages from $1 to $1.25 an hour, and covering an additional 3.7 million workers, increased the wages of some 3 million workers. There is, however, wide disagreement upon the number of jobs which minimum wage legislation may have eliminated.

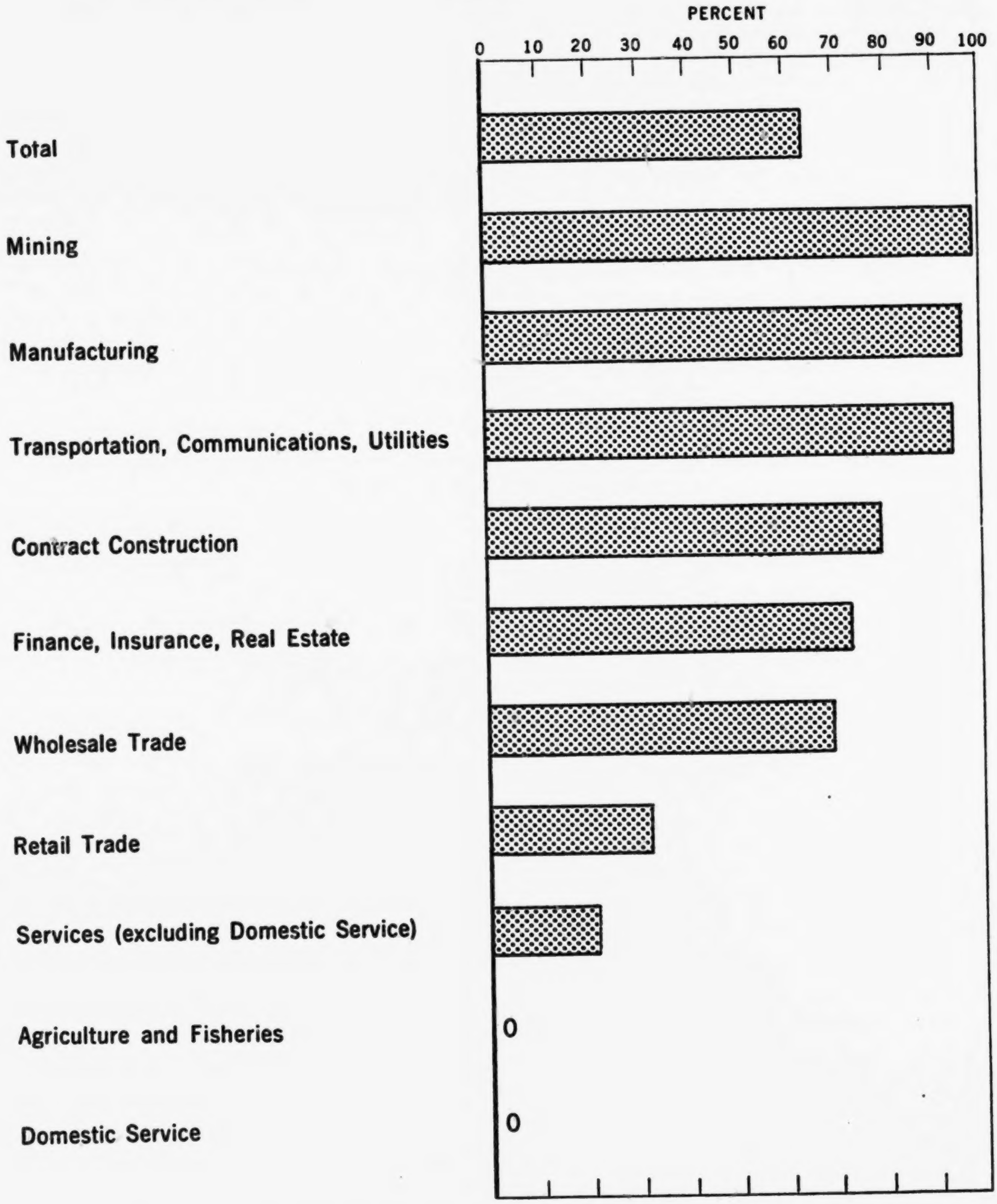
In a dynamic economy it is impossible to isolate the effects of the statutory minimum wage legislation from other developments. Opponents have argued that minimum wage legislation is a significant obstacle to youth employment, but convincing evidence is hard to come by. For example, the New York State minimum wage law is virtually inclusive and requires the payment of $1.25 per hour in retail and service industries. Since these are a major source of jobs for youths entering the labor force, it might be expected that, other things being equal, youth unemployment in New York would be higher than in those States with no laws regulating minimum wages in these industries. Because only fragmentary data are available showing comparative youth unemployment rates, no conclusive judgment can be made on the impact of minimum wage legislation upon youth unemployment. The impediments to youth employment result from a complex series of factors, and there is little evidence that minimum wage legislation is a controlling factor in the high level of unemployment which has existed among youths throughout the United States.

This conclusion does not negate the argument of some economists and others that the elimination of statutory minimum wages would boost total employment because employers would find it profitable to hire new workers below current minimum levels. However, reliance upon the elimination of minimum wages as a means of increasing employment would require the acceptance of radical changes in our society's values and a sharp curtailment of our welfare system. For as long as society continues to provide for the basic needs of most of the destitute, the unemployed can hardly be expected to accept jobs which provide little more income than benefits paid under the welfare system. And in most States even low earnings would disqualify a worker from receiving public assistance, thus destroying the incentive to accept a job below current minimum wage rates. We must conclude, therefore, that the elimination of minimum wage statutes is at best a doubtful panacea for the reduction of unemployment. Still, as far as youth employment is concerned, the present legislation permitting employers to pay rates below the minimum wage to learners might be extended by allowing employers to count investment in training toward minimum wages they are required to pay.

It should be noted parenthetically, from an economic point of view, that Federal raises in minimum wages have come at propitious times. The original legislation in 1938 had only a minimal impact, but a year later the raise of the statutory minimum hourly rate to 30 cents coincided with the prewar economic expansion. Adjustments to the

Chart 4.

NONSUPERVISORY EMPLOYEES COVERED UNDER THE FAIR LABOR STANDARDS ACT, 1964



Source: U.S. Department of Labor.

next boost in minimum wages, a 75-cent hourly minimum which became effective in January 1950, were eased by the inflation period resulting from the Korean war. The $1-an-hour minimum was enacted 5 years later, when the American economy was experiencing a high level of employment and general prosperity. The latest boosts in minimum wages occurred during the most prolonged peacetime expansion period yet experienced by the American economy. It is impossible, therefore, to evaluate with any degree of certainty the true impact of the Federal minimum wage legislation. Each congressional action directly affected no more than the lowest 12 percent of covered wage earners, and the total direct wage hikes required by the legislation accounted for less than 1 percent of total covered payrolls.

Possibly the most thorough attempt to evaluate the impact of minimum wage legislation was conducted by the New York State Department of Labor in 1958, when the statutory hourly rates in retail trade were raised to $1 an hour in larger cities and to 90 cents in smaller communities.[13] The New York survey found that employers affected by the increased wage rates have used a variety of actions to adjust to the higher costs. Altogether, 1,000 employees (one-sixth of 1 percent of all retail workers), many of them part-time workers, lost their jobs as a result of the boost in minimum wages, and another 500 were not replaced when they quit. On balance, it does appear that at least in the short run the aggregate gains to employees in terms of wages exceeded appreciably any negative impact in lost jobs: For every dollar lost in wages, the employees who retained their jobs got $4 in wage increases. Yet it is impossible from this study to evaluate the impact of the wage increases upon costs to consumers, profits to store owners, or the potential hiring of new employees. Nor did the survey attempt to evaluate the impact of the wage increases upon the level of living of the low-paid workers.

Economists would appear to be at a loss to advise policymakers on the impact of minimum wage legislation upon aggregate employment and disemployment. In the final analysis, an economist's conclusions will depend upon what he believes deep down in his heart to be true; and whatever his conclusions, it is likely that he will find some relevant supporting facts. Those who favor minimum wage legislation voice social and humanitarian objections to substandard wages and stress the economic need to widen the base of consumer purchasing power. Opponents retort that minimum wage legislation extends the evils of governmental interference with free market forces and that arbitrary meddling with the determination of minimum wages may cause disemployment, thus causing results opposite from those intended by the proponents of minimum wage legislation. Some observers advocate that employers of labor with low productivity be subsidized by the Government so that they can pay a socially acceptable minimum wage.

Many proponents would concede that minimum wages should be raised no more rapidly than average wages in American industry. While little is known about productivity trends in low-wage industries affected by minimum wage legislation, it is reasonable to assume that the rise of productivity in these industries is no greater than in the rest of the American economy. If this assertion is correct, and available fragmentary data suggest that it is so, it would indicate that boosts in minimum wage legislation should be limited at most to rises in cost of living plus average increases in productivity. This rule of thumb suggests short-run implications for Federal minimum wage policy.

During the 4 years following September 1961, the effective date for the latest amendments to the Fair Labor Standards Act, average wage rates in manufacturing, exclusive of fringe benefit costs, rose about 15 percent, while minimum wages increased 25 percent. This fact alone should indicate the need for exercising caution in considering any further increases in minimum wages over the next few years, assuming the continuation of recent trends in overall productivity and consumer prices. The wisdom of using statutory minimum wages to upset existing wage differentials may also be questioned. If movements in average manufacturing wages are taken as a guide, it would appear that Federal minimum wage rates have about kept pace with wage changes in American industry. Since 1939, every boost in Federal minimum wages has been geared to setting minimum wage rates at about half the average wage rates in manufacturing. While there is nothing sacrosanct about existing wage differentials, a significant realignment due to excessive boosts in minimum wages might lead to accelerated elimination of low-paying jobs.

Moreover, the most acute unemployment problem we are now facing is found among teenagers who normally enter the labor force in lower paid jobs. Additional boosts in minmum wages might tend to impede further the hiring of new entrants into the labor force. But some have questioned whether high youth unemployment should be a controlling consideration in raising minimum wages. They emphasize that widespread poverty among heads of families who work on full-time jobs suggests that for millions of adult workers statutory minimum rates are not entry wages but continuing wages of these workers throughout their lifetime. Cogent as this argument might appear, it leaves unanswered a more basic issue;

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[13] New York State Department of Labor, "Economic Effects of Minimum Wages: The New York Retail Trade Order of 1957-58" (publication B-148), 1964.

namely, whether the low-paying jobs would exist at all if minimum rates were raised above levels justified by the productivity of the affected workers. At best, therefore, it would appear that minimum wage legislation is only another tool in the war on poverty.

On the other hand, it should be recognized that some forced adjustment of the price structure may be used to effect public policy. The recent experience with the elimination of imported farm labor is a case in point. Secretary of Labor W. Willard Wirtz took the position that adjustments in the price structure for certain agricultural commodities would enable food growers to raise wages of farm labor sufficiently to make jobs in agriculture attractive to American workers. It was estimated, for example, that raising the cost of lettuce by about a penny a head would make it possible for growers to hike wages by about 50 percent. Similar small increases in the cost of other fruits and vegetables to consumers would enable growers to pay "minimum decent" wages to their laborers.

But there are limits to which price adjustments can be used to boost wage costs. Some liberal spokesmen who are fond of asserting that an affluent society should not tolerate a $1.25 minimum wage have proposed legislation to raise the hourly minimum to $2. Regrettably, such pronouncements are more rhetoric than serious policy alternatives. Reasonable people may differ over whether the current minimum wage should be extended to additional millions of workers, and whether it should be kept for a while at the present level or raised by a few cents. But there can be little doubt that too rapid boosts in the minimum wage would cause serious economic dislocations and disemployment. It would be a case of killing the goose that laid the egg, for the way to fight poverty is not by the elimination of jobs. The proposed raise in minimum wages by 40 percent, from $1.25 to $1.75, over a 3-year period, first considered by Congress in 1965, is therefore fraught with danger and may lead to the elimination of many jobs. If the bill is enacted into law, it should be accompanied by a work relief program which would provide employment to displaced workers.

Without negating or minimizing the past achievements of minimum wage legislation, it would be unrealistic to place excessive reliance upon such legislation as a tool to combat poverty. Moreover, except for the youth employment measures, existing programs for improving labor market services, training the unemployed and helping depressed areas apparently are not geared to minister aid to a significant proportion of the poor. If society is determined to reduce poverty at a more rapid rate than in the past, other tools will have to be relied upon.

Provision of Services and Goods

In our society, the State has assumed the responsibility of providing many social services to its citizens. Most of these benefits are made available without regard to recipients' level of income, and their cost exceeds manyfold the total outlay in aid of the poor. Governmental expenditures in providing education to the Nation's children and youth are twice as costly as all the programs aimed directly at aiding the poor. In addition to direct public services, there are what Richard M. Titmuss of the London School of Economics has called the "iceberg of phenomena of social welfare." [14] This refers to the revenue system which exempts certain types of expenditures from income taxes. One example of this "fiscal welfare" system is the provision allowing for deduction of interest paid on home mortgages from regular income subject to taxation. Many other examples could be cited. It may be noted that many direct public services, as well as the "fiscal welfare" provisions, tend to favor the affluent members of society over the poor. An authoritative foreign observer of the American scene, Gunnar Myrdal, has observed:

> In almost all respects—minimum wages, social security, agriculture, housing, etc.—American economic and social policies show a perverse tendency to favor groups that are above the level of the most needy.[15]

We are concerned here with services and goods which the Government makes available to the poor on the basis of need, though these are not always separable from overall government services and fiscal aids. Child services are combined for poor and affluent families, while separate housing programs are provided on the basis of need. Two other programs—food distribution and medical assistance—are also discussed in this section. As a rule, the benefits of these programs are available to the needy regardless of their labor force status.

Services for Children

Programs to aid children were the earliest social welfare services provided by the Federal Government, dating back to the Taft Administration. The Social Security Act provides grants to States on a matching basis for four types of programs:

1. Welfare services to help children in difficulty vary from community to community, but they generally include social services to children in their own homes, protective services to neglected and abused children, foster care, day care, and related services.

2. Maternal and child health services include maternity clinics and clinics for mentally retarded children.

3. Services for crippled children provide diagnostic and other needed care.

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[14] "The Role of Distribution in Social Policy," *Social Security Bulletin,* June 1965, p. 16.

[15] George H. Dunne, S.J., ed., *Poverty in Plenty* (New York: P. J. Kennedy & Sons, 1964), p. 122.

4. Health care for needy children. The 1965 amendments to the Social Security Act provide for comprehensive health care for needy children in areas where low-income families tend to concentrate.

Total costs of these programs in 1964 amounted to about half a billion dollars, with the Federal Government contributing about a fifth of the total costs. However, Federal contributions to child welfare programs have been increasing in recent years, and current legislation provides for additional expansion of Federal aid. Under existing legislation, annual Federal grants to States for maternal and child welfare programs amount to about $170 million and are due to rise to about $250 million before the end of the decade.

Except for health care for needy children, added in 1965, these service programs are not aimed exclusively at the children of poor families, though most beneficiaries of maternal and child health services are from low-income families. An official Government brochure describing the child welfare services announces that the program is designed "for troubled children and children in trouble." Problems of child neglect, abuse, and emotional disturbance are not limited to impoverished homes, though it is not at all surprising that poor children have more than their share of such problems. Consequently, children from impoverished homes are likely candidates for assistance offered by child welfare programs. A 1963 study found that while AFDC children constitute less than a 20th of the total child population, they accounted for nearly a fifth of the children receiving child welfare services. Altogether, more than 1 of every 4 recipients of child welfare services administered by public agencies was a member of a family which receives some type of public assistance.[16] In addition, many other poor children who are not public assistance recipients may be beneficiaries of child welfare services.

The community action program under the Economic Opportunity Act of 1964 has further expanded services offered to children of impoverished families. Many projects funded by the community action program have augmented the resources of traditional child services which minister to the needs of poor families. The Office of Economic Opportunity favors broad antipoverty programs, such as neighborhood centers which coordinate diverse services to the poor, rather than single-purpose projects. Nevertheless, about one-third of the total of the $235 million allocated in fiscal 1965 to CAP was committed to the Head Start Program, which is the poor child's preparatory school for elementary education.

Ample data have been gathered which indicate that children from impoverished homes are frequently not adequately prepared to start school. In more affluent families, educational processes start at home where the child is exposed to educational toys and books and where he learns to articulate his thoughts long before he enters school. Frequently lacking these advantages, a child from an impoverished home may be "retarded" from the day he enters school. Head Start exposes the child to the world of learning, in addition to furnishing at least one nourishing meal a day—which many impoverished children do not get at home. During the course of a Head Start project, an eyewitness noticed that one child saved cookies which he received with lunch. When asked why he didn't eat his cookies, the child replied simply, "My baby sister needs food." [17]

While an appraisal of the whole Head Start program would be premature at this time, available figures indicate that more than half a million children, mostly from impoverished homes, participated in the program during the summer of 1965. And spokesmen for the program were already sufficiently sold on the results to favor an expansion of Head Start on a regular basis.

It is also too early to assess the other diverse and broad community programs funded by the Office of Economic Opportunity. Thus far, most of the Federal financing has provided "seed" money to inaugurate a wide variety of community services to the poor. The administration and Congress believe that the early beginnings are sufficiently promising to warrant the expansion of the Commuity Action Program. The administration requested Congress to invest $685 million in the program for fiscal 1966, and Congress responded by authorizing the expenditure of $850 million.

More than additional funds are involved in the Federal backing of CAP. The underlying assumption is that broad-based community action programs in which the poor actively participate are needed to combat poverty. This is in contrast to established single-purpose programs which normally offer services *to* the poor rather than working *with* them to resolve problems. The Federal funding of broad-based community action programs also implies that established agencies, responsible for narrow programs, lack the ability to adapt techniques and methods to reach and to serve the poor adequately.

Food Distribution Programs

Without decrying the goals or potential of the recent war on poverty, the admonition of a social worker from an earlier generation is still applicable today: "Social services never filled an empty stomach." While outright starvation may be rare in the United States, millions of persons do not have the means to purchase food for a well-balanced and adequate diet. To help improve the diet of needy persons and to help dispose of surplus agricultural foods, the Federal Government has subsidized the food stamp program and operates a direct food distribution program. In addition, the national school lunch program and the special milk program are designed to improve the nutritional well-being of all children, with a built-in mandate to provide free or reduced price lunches to needy children in schools where the programs operate.

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[16] U.S. Department of Health, Education, and Welfare, *Children Problems and Services*, by Helen R. Jeter (Washington: U.S. Government Printing Office, 1963), p. 140.

[17] Monroe W. Karmin, "U.S. Program To Help Underprivileged Pupils Begins Amidst Doubts," *The Wall Street Journal*, June 30, 1965.

More than 17 million elementary and secondary school children—35 percent of the total number of school children—regardless of their family income level, benefited from the school lunch program in the 1964–65 academic year; and all levels of government combined contributed nearly half of the $1.6 billion expended by the school lunch and milk programs. The Federal share amounted to $483 million, including $130 million cash disbursements for the lunch program and $98 million for the special milk program, with the balance coming from surplus commodities. State and local governments contributed $324 million, and the remainder ($788 million) was paid by the children.

The National School Lunch Act of 1946 requires schools participating in the program to provide free or reduced-cost lunches for needy children, and nearly 1 of every 10 lunches provided under the program were made available to children free or at reduced prices. These lunches were served to over a million needy children. However, a 1962 study by the Department of Agriculture found that another 1.2 million needy children, or on the borderline of need, were not receiving these lunches. Nearly half a million of these impoverished school children attended public schools which participated in the program; but because of the heavy concentration of needy children, school authorities in these areas lacked the resources to provide free lunches for all who needed them. Another 700,000 needy children attended public schools which had no lunch service because of the schools' relative isolation or lack of facilities.[18] Gunnar Myrdal's observation that welfare legislation tends to favor the more affluent is well illustrated by these programs.

This is one of the costs of poverty: Because many needy children are concentrated in impoverished areas, they are denied free lunches; at the same time more affluent students receive the benefits of Government-subsidized meals. This is not to argue that affluent children should be denied participation in the nationally subsidized school lunch program. Prof. Don Paarlberg, a former Assistant Secretary of Agriculture, concluded in his study of federally subsidized food programs that the lunch program improves "the educational experience of participating children . . . attendance [and] attentiveness in class."[19]

A 1962 amendment to the National School Lunch Act did include an annual authorization of $10 million for "special assistance to schools drawing attendance from areas in which poor economic conditions exist . . ."; but no funds were made available for this purpose until 1965 when Congress appropriated $2 million for the program.

The Federal Government also makes food available to needy persons through a program dating from the 1930's. The Department of Agriculture distributes processed and packaged foods to designated State agencies. In 1965, 48 States, including more than half of the counties in the Nation, participated in the program. The food donated by the Government is acquired under the price support and surplus removal programs. The commodities include butter, lard, cheese, flour, cereals, dry eggs and milk, livestock products, beans, and rice.

Participating in the program in 1965 were an average of 5.3 million people, about equally divided between public assistance recipients and other needy persons. The total cost to the Government to acquire, process, and ship these commodities amounted to $225 million, or $42.50 per recipient. The retail cost of these commodities would be nearly double this amount. Since the Department of Agriculture calculates that the annual food budget per person in a low-income family amounts to about $250, it may be estimated that the commodities distributed by the Department account for about a third of the total food costs of those who participate in the program. Thus, the direct food distribution program provides a socially acceptable outlet for surplus agricultural commodities.

Direct food distribution has enormous advantages to the Government. Except for the cost of packaging and transportation, there is no additional cost to the Government because the donated commodities have already been acquired to achieve a social goal unrelated to food distribution; namely, providing price supports for surplus agricultural commodities. Nevertheless, the program has been criticized on several grounds. Not only do the available surplus commodities fail to supply adequate food for a balanced diet, but the procedures involved in its distribution show little concern for the self-respect of recipients who normally have to line up at Government warehouses or relief agencies to receive their "commodities." In addition, direct food distribution fails to utilize existing retail outlets.

Shortly after assuming office, President Kennedy instructed the Secretary of Agriculture to revive, on a pilot basis, the food stamp plan which was in operation between 1939 and 1943. Enabling legislation for the plan had been enacted during the Eisenhower administration, but the Secretary of Agriculture had not implemented it. Under the food stamp plan, eligible families—public assistance recipients and other needy persons as determined by the States—may exchange money they would normally spend on food for stamp coupons whose value is greater than the amount paid. The coupons may then be exchanged in retail stores for domestically produced food (imported caviar is out). The value of the bonus coupons decreases as income increases. For example, a family of four with a monthly income of $40 receives $3 worth of coupons for each $1 of food purchased. The amount which a family is required to pay for the coupons increases as income approaches the maximum permitted for recipients to remain eligible. The upper income limit for a family of four is about $3,000 annually, at which point the bonus is about one-fifth of the family's total allotment of coupons.

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[18] U.S. Department of Agriculture, "Food Service in Public Schools," Marketing Research Report No. 681, November 1964, p. 15.

[19] *Subsidized Food Consumption* (Washington: American Enterprise Institute, 1963), p. 30.

As initiated in May 1961, the program was limited to impoverished residents in eight depressed areas. The program expanded so that by mid-1965 needy families in 29 States, including 110 areas, were eligible to participate. The total number of participants at that time was 633,000. Food coupons issued during fiscal 1965 were valued at $85.5 million, involving a bonus of $32.5 million to the participants. Thus the participants received about $1.60 worth of food in retail stores for every dollar they paid. Current plans would expand the food stamp plan during 1966 to include a million persons, and eventually a total of 4 million people at an annual cost to the Government of about $360 million.

The major purposes of the food stamp program are to upgrade the quality of diet, increase food consumption, and allow the poor free selection of food purchases. Studies conducted by the Department of Agriculture in the initial eight pilot areas seemed to indicate that food purchases by participating families increased significantly. In Detroit, where half the original participants were located, food expenditures of recipients increased 34 percent. In rural areas increases were smaller.

A major criticism of the program, aside from its costs, is that it tends to make the recipients dependent upon the Government and thus destroys self-reliance. Most observers would agree that reliance upon the Government for basic needs is undesirable. However, one may also consider whether the alternative, a deficient and debilitating diet, is not less conducive to self-reliance.

Housing

The Federal Government is heavily involved in the housing business. The magnitude of its involvement is reflected by the 1965 Housing Act which carries a multi-billion-dollar price tag in a combination of insured loans, grants, and subsidies to be expended over a 4-year period. Several of the housing programs are designed exclusively to provide adequate shelter for the poor. These include public housing, rent subsidies, grants to help rehabilitate homes for poor families displaced by urban renewal or public transportation projects, and special housing programs for older persons and farm laborers.

The rationale for providing Government assistance to shelter the poor adequately is the well-established fact that unsubsidized private enterprise cannot do so profitably. In the absence of Government subsidies or grants, the poor are confined to slum and substandard shelter—housing that is dilapidated or lacking plumbing facilities. The shortage of adequate housing for the poor appears almost insurmountable in the short run. According to the 1960 census, 5.3 million families with an annual income of less than $3,000 lived in substandard housing. Only 1,750,000 of the Nation's standard (adequate) housing units rented at less than $50 a month; therefore, with an annual income of less than $3,000, most of the impoverished resided in substandard or overcrowded housing. Thus far, Government housing programs have filled only a small portion of the housing needs of poor families.

The oldest Government measure designed to provide shelter for the poor is the public housing program which dates from 1937. During nearly three decades, the Federal Government has provided some 600,000 housing units for impoverished families. Attempts to accelerate the construction of public housing during the post-World War II period have not materialized; in recent years an average of about 25,000 units have been completed each year. Some major cities have added no new public housing during recent years. In mid-1965, more than 100,000 units for which funds were available had been approved by the Federal Government, but construction on most of these projects had not started. A major barrier to the construction of public housing is the unavailability of sites. Even where sites are available, organized community groups have frequently raised effective opposition to locating public housing for impoverished families in the midst of more affluent neighborhoods. Racial prejudice is another obstacle to construction, since a large proportion of public housing residents are Negroes.

Public housing is constructed at no cost to the local community, though the community may incur expenses in providing services to the project after it is built. No taxes are paid on public housing. The initial planning and development are financed through loans from the Federal Public Housing Administration. When the project is sufficiently advanced, the community floats federally guaranteed bonds in the open market to cover the cost of the project and to repay the initial Federal loan. The loan is then amortized by the Federal Government over a period of 40 years. The Federal Government also pays an annual contribution of $120 for each unit occupied by aged or handicapped persons. Rental fees cover upkeep of the project; payments to the community in lieu of taxes amount to about 10 percent of the rent collected on the project, which is normally less than the full amount of taxes paid by private owners on comparable facilities. Residents are charged rents amounting to 20 percent of their monthly income. According to a survey made in 1963, the median income of new occupants was $205 a month. The average monthly rent was therefore $40, regardless of the true cost of the space occupied by a new family.

Authorized contributions to subsidize the public housing program amounted to $366 million in fiscal 1965 and $413 million for each of the subsequent 4 years. The 1965 law authorizes the construction of 35,000 new units a year, and the lease or purchase, including renovation when necessary, of an additional 25,000 units.

In 1965, the Government also undertook to pay part of the rent for impoverished families living in substandard housing or displaced by Government action, such as urban renewal, and for impoverished families with aged or handicapped members. Under this program, private nonprofit organizations, limited dividend corporations, or cooperatives were authorized to borrow funds, guaranteed by the Federal Government, in the open market to build or acquire homes at an anticipated average cost of $12,500 per unit. The monthly rent paid by the occupants would be no more than 25 percent of their income. A family with a monthly income of $240 would be required to pay $60. Assuming that a fair economic rent for the housing unit is $90, the Government would pay the difference between the true cost of the housing and the amount the occupant would be required to pay.

The major innovation of the new program is that it will enable impoverished families to live side by side with more affluent neighbors. If the family's income increases, the rent subsidy will decline. Under the new program a family will not be displaced if its income rises above the subsidy level, as is now the practice in public housing. While controversy over this new program centered around the direct subsidies feature, the idea of special provisions to cover costs of housing is hardly new. Subsidies have been offered for a period of 28 years to cover the cost of public housing, and are also part of the Federal tax structure which permits income tax deductions for mortgage interest. The mortgage guarantee program is another subsidy to homeowners. Alvin L. Schorr, an authority on public housing, has estimated that in 1962 Federal subsidies, via income tax deductions, to homeowners in the upper 20 percent of income distribution amounted to $1.7 billion, compared to $820 million of Federal subsides for poor people.[20] These and other facts led one newspaper to support the new housing subsidies in the following terms:

> The question, then, is not whether this country intends to subsidize its citizens' shelter. That was settled a generation ago. The current question is whether the country intends to subsidize the poor as widely as it does the wealthy and whether it intends to subsidize the renters as well as the buyers.[21]

In 1965, Congress authorized the commitment of $30 million in rent subsidies for fiscal 1966, but appropriated only $450,000 for the year to enable the Housing and Urban Development Department to prepare plans for the program. The level of subsidies is to be increased during the subsequent 3 years, and the total annual commitment will reach $150 million in fiscal 1969. It was estimated that the total originally authorized expenditures (assuming that funds would actually be appropriated and expended) would provide an additional 250,000 to 300,000 housing units for the poor over the next 4 years, depending upon the extent of subsidies that will be paid per unit. At this early stage it is, of course, impossible to predict whether the program will be viable. Experience with public housing has indicated the difficulty of providing impoverished families with adequate shelter, even when funds are available.

Medical Services

In addition to food and shelter, certain medical services are now considered by our society as essential ingredients for a minimum standard of living. Public assistance programs include medical services as part of a basic-needs budget. In fiscal 1964, nearly one-quarter of the $4.9 billion expended for public assistance went to suppliers of medical care (that is, vendor payments). Among the medical services are hospitalization, nursing-home care, physicians' services, and prescribed drugs (chart 5).

The Federal Government has, since 1960, contributed directly to medical care for indigent aged persons. States participating in this program are required to provide qualified beneficiaries with institutional and noninstitutional medical care. Thirty-seven States participate, and Federal contributions range from 55 percent to 83 percent of total cost, depending upon the State's per capita income—the lower the income, the higher the share of Federal contributions. This formula differs from other public assistance programs where Federal contributions are included as part of the grants

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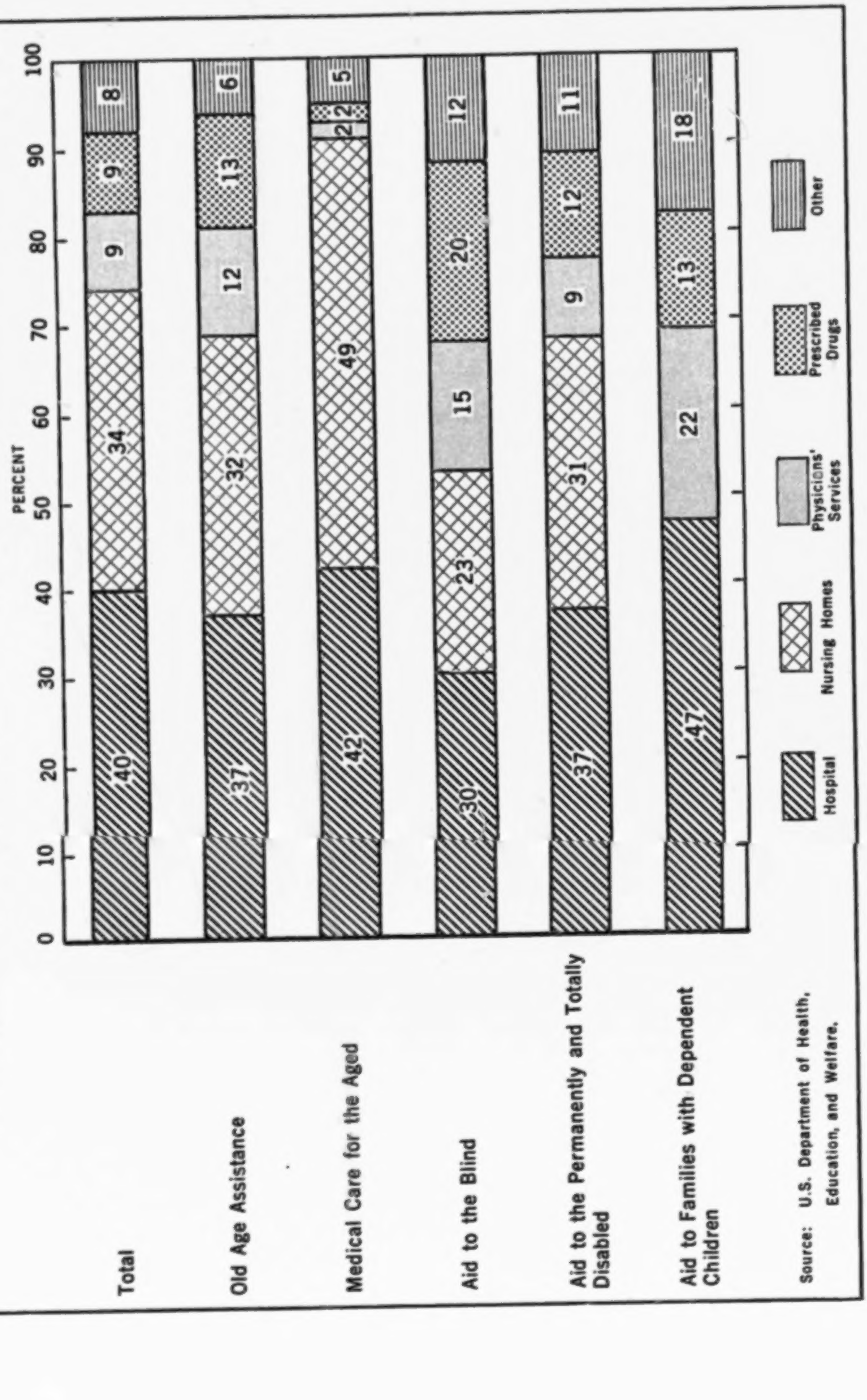
[20] "National Community and Housing Policy," Elizabeth Wood lecture, School of Social Service Administration, University of Chicago, Mar. 9, 1965, p. 5 (mimeo.).

[21] "Subsidy and Substance," *The Washington Post*, July 4, 1965.

Chart 5. PERCENT DISTRIBUTION OF FEDERALLY SUPPORTED PUBLIC ASSISTANCE PAYMENTS TO SUPPLIERS OF MEDICAL CARE BY TYPE OF PROGRAM, FISCAL 1964



Source: U.S. Department of Health, Education, and Welfare.

and are subject to the maximum limitations discussed earlier. In fiscal 1964, total payments to suppliers of medical care amounted to $1.1 billion.

TABLE 3. PUBLIC ASSISTANCE PAYMENTS TO SUPPLIERS OF MEDICAL CARE, BY SOURCE OF FUNDS, 1964

Type of program	Amount (millions)	Source of funds (percent)		
		Federal	State	Local
Total	$1,147.9	55.5	32.8	11.7
Old-age assistance	422.0	65.1	30.5	4.4
Medical assistance for the aged	381.7	51.2	30.4	18.4
Aid to the blind	11.0	48.4	45.0	6.6
Aid to the permanently and totally disabled	108.4	57.4	32.7	9.9
Aid to families with dependent children	121.1	57.5	31.5	11.0
General assistance	103.7	----------	49.7	50.3

SOURCE: U.S. Department of Health, Education, and Welfare.

The 1965 enactment of Medicare will have a profound effect upon medical services offered to the entire aged population. Dr. Ida C. Merriam, Director of Research for the Social Security Administration, has stated:

> Medicare . . . would largely remove one major cause of poverty among the aged. It would help relieve one of the most persistent fears of old age—the fear of medical expenses, of savings wiped out, children burdened beyond reason and public assistance at the end of the road.[22]

The new legislation will not only provide needed medical services for the aged but also will release available funds to expand medical services to other groups receiving public assistance. As shown in table 3, more than two-thirds of total public assistance medical expenditures have been allocated to the aged poor. The medical assistance for the aged program (Kerr-Mills) will continue, but most of the present costs of old-age medical assistance will be covered from Medicare funds. To provide more adequate medical services to other needy persons, the legislation extends the same services—now available only to the aged—to all federally subsidized public assistance recipients as well as to other needy persons who do not receive cash assistance.

The implementation of this legislation will, of course, require State action; the medical assistance for the aged program enacted in 1960 had not been adopted by 13 States 5 years later. However, the 1965 Social Security Act amendments specify that all Federal contributions for the payment of medical care under public assistance programs will be terminated by the end of this decade. This should be an adequate incentive for all States to join in the federally subsidized programs and provide expanded medical care to all recipients of public assistance.

Payments of public assistance funds to suppliers of medical care accounted for one-eighth of the $9 billion in public funds expended for health services in 1964. Over and above public assistance, some of the programs focused on providing medical care to indigent families; included among others were State and local programs for general medical and health care and maternal and child care, discussed earlier. A majority of patients in Veterans Administration hospitals qualified for medical care on the basis that they were unable to defray the cost of hospitalization. The abovementioned programs accounted for more than half of all public funds expended for health services. But medical expenditures for military personnel, workers injured on their jobs, research, construction of medical facilities, and other health programs, go mostly to persons who are above the poverty threshold. Moreover, subsidies resulting from income tax deductions, claimed by more affluent families, still exceed medical outlays under the public assistance programs.

The planned expansion of medical services to the poor envisioned by the 1965 Medicare legislation does not necessarily guarantee any improvement in the quality of these services. Dr. Merriam has observed:

> Practically no one in the United States goes completely without housing or education or medical care; but the state of the housing, the length and quality of the education, and the kind of medical care can be worlds apart. Such differences are difficult to measure, but . . . no one doubts their reality or importance.[23]

The 1965 social security amendments provide for additional allocation of resources for medical and health care to the rich and the poor. This program will no doubt enlarge the demand for medical facilities and associated professional services. But related legislation providing for the expansion of supply may not be commensurate with additional resources allocated to demand. Suppliers of medical care will be hard pressed, therefore, to meet the anticipated expanded demand, at least in the short run.

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[22] "The Promise and Problems of the Medicare Program," *Conference Board Record*, August 1965, p. 10.

[23] *Ibid.*, p. 8.

Alternative Income Support Programs

Public assistance is currently the primary vehicle for transmitting aid to the poor. The shortcomings of this program have already been reviewed. The income support provided is inadequate to meet basic needs of recipients, and even this support tends to discourage initiative because benefits are based on a stringent means test. Except for minor exemptions, earnings by relief recipients are normally deducted from benefits they receive, thus creating an incentive for the beneficiaries to withdraw from the labor force. Moreover, the majority of needy persons do not receive any assistance, and nearly four of every five poor persons do not receive public assistance. The Federal Government shares the cost of public assistance to selected groups—aged, blind, permanently disabled, and families with dependent children. States and local governments provide some assistance to needy persons outside these categories. But in may areas the destitute depend on private charity or have no support at all.

An additional problem of public assistance programs is that they have limited applicability to the working poor. Related programs intended to aid workers in the labor force, employed as well as unemployed, tend to bypass most of the poor, yet minimum wage legislation has raised the level of income of many working poor. The result of these inadequacies, as noted earlier, is that 2 million family heads (in 1963) having full-time year-round jobs received earnings insufficient to raise them above the poverty threshold.

Family Allowances

While the acceptance of the principle of equal pay for equal work is desirable as a means of eliminating discrimination based on color or sex, it ignores the needs of families with children and tends to deprive children of large families of basic needs. The underlying justification for family allowances is that the well-being of children should be the concern of society as a whole. Family allowances also recognize that the wage system alone is an inadequate basis for distribution of income.

Providing minimum family needs under the wage system is an age-old problem which has occupied policymakers since the early days of the industrial revolution. It was tried first on a modest basis in England 170 years ago and has spread widely during recent decades. It is now practiced, under one form or another, by most industrial countries. Family allowances are given in all European countries and in about a third of the nations outside Europe. In several countries these allowances account for a significant share of the total income received by families whose heads are low-wage earners and by families without breadwinners.

The family allowance programs for minimum needs in France and Canada illustrate two diverse types of systems. In France it is estimated that for a family of five, including three children, family allowances amount to about a quarter of total average wages paid in manufacturing; for a family with five children, the family allowances would add about two-thirds to the average wages earned in manufacturing. Family allowances in France are financed by employers and amount to 13.5 percent of total payrolls. In Canada, by contrast, family allowances are paid by the Government from the general revenue. The monthly allowance amounts to $6 (Canadian) for each child under 10 years of age and $8 for each child between the ages of 10 and 16. Thus, the Canadian family allowances supply an insignificant proportion of total family income.

Our wage system is not adapted to take account of the diverse needs of workers, except for some adjustments in income taxes; for example, the take-home pay from two identical jobs is the same for a bachelor as for the head of a family with dependents. Despite the wide acceptance of the family allowance principle in other countries, the idea has never received active consideration in the United States—though it has been advanced on numerous occasions.[24] An exception has been made under AFDC for most needy children. Expenditures under this program account for 0.3 percent of national income. A number of countries spend 10 times this percentage or more of their national income for family allowances. France, for example, allocates about 5 percent of national income to family allowances. And the trend in these countries has been to raise the proportion of national income devoted to family allowances.

Negative Income Tax

With the current commitment to wage war on poverty, various proposals have been advanced to supply additional income for the poor. The ultimate goal of these proposals is to raise the income of the poor and to eliminate poverty. The Social Security Administration has estimated that the addition of $11.5 billion would permit the 34.6 million persons designated as poor in 1963 to escape poverty.

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[24] Paul H. Douglas, in *Wages and the Family* (Chicago: University of Chicago Press, 1925), advocated a family allowance system financed by employers. The late Senator Richard L. Neuberger of Oregon, a more recent advocate, proposed a Senate study of the feasibility of family allowances. His resolution (S. Res. 109, 84th Cong., 2d sess.) was cosponsored by seven other Senators, including Paul H. Douglas, Hubert H. Humphrey, and John F. Kennedy; but it never received a hearing.

The most widely discussed proposal is utilization of the income tax machinery as a vehicle to supply income to the poor. The law, providing now only for the collection of taxes, might be extended to include grants based on family or individual needs. Prof. Robert J. Lampman of Wisconsin University has prepared the most careful and detailed cost estimates of different types of negative income tax proposals. The cost estimates presented in this section are based on Lampman's calculations.[25]

In its simplest form, a negative income tax would allow nontaxable individuals or families to claim the unused portion of their current exemptions. Such a plan would tend to spread the benefits thinly among most of the poor, but would still cost about $2 billion. If it were limited to families with children, the cost would be reduced by about one-half. A family of four with zero income would be entitled to a "rebate" of $420. An "average" AFDC family—a mother with three children—would receive somewhat more than $200 in addition to the nearly $1,500 of AFDC benefits, assuming that the States will continue current levels of assistance.

At the other extreme, negative income tax proposals would overhaul the present tax system to pay the poor enough income to close the poverty income gap which, as stated, amounted to $11.5 billion in 1963. Poverty would thus be eliminated. However, such an income maintenance level would rob any pecuniary incentives for millions of people to work since the guaranteed income would be equal or in excess of their earned wages. A workable plan would permit low-wage earners to keep at least a portion of their earned income in order to provide them an incentive to continue working. This would, of course, increase the cost of the income maintenance program by a larger amount than the $11.5-billion poverty income gap. Lampman estimates that the cost of such a program would be double the present poverty income gap, or about $23 billion. This appears to be a conservative estimate.

A compromise between the above two plans would guarantee income to cover 50 percent of the poverty income gap. Thus a family of four would receive a guaranteed annual income of $1,565, based on the Social Security Administration estimates of basic needs. The cost of such a plan would be $8 billion. But this amount includes about $3 billion which is now currently paid to public assistance recipients. The net cost would, therefore, be about $5 billion. If the plan were limited to families with children, the cost would amount to $4.8 billion less the $1.3 billion now paid to public assistance recipients. As in the previous proposal, this scheme would also have to provide for continued incentive to work and allow low-income earners to keep all or part of their earnings. The cost would therefore be raised appreciably above the estimated $5 billion.

The three variations of negative income tax schemes suggest the cost magnitude of any negative income tax plan. The three proposals listed above would incur annual costs ranging from $2 billion to $23 billion or higher. Different variations of these plans would involve a cost anywhere between these two extremes. Huge as these sums might appear, an addition of $5 to $23 billion to the income of the poor—ignoring the first scheme which would distribute the limited funds broadly—might be an attainable goal, given our society's present commitment to combat poverty. However, providing the poor with added income is only one aspect of combating poverty. The poor also need better schools, housing, training, and diverse services to improve their ability to compete for jobs in the labor market. Any adequate public welfare system, whose goal is to reduce poverty, must therefore aim at a judicious distribution of resources, both for raising the income level of the poor and for providing them with needed services.

Competing Goals

The goal of eliminating poverty is only one of many aspirations of our society which involve substantial financial resources. Alfred C. Neal, president of the Committee for Economic Development, suggested that the efficient pursuit of our national goals is "the number one economic challenge" for the immediate and foreseeable future:

> Our number one problem is not growth as such. It is not elimination of domestic poverty or the economic development of the emerging countries. It is not the problems of the metropolitan cities (air and water pollution, traffic jams, urban sprawl, dropouts, crime and delinquency, important as each of these may be). Our principal economic problem is not the attainment of supremacy in space, or even better education.[26]

The National Planning Association has recently attempted to calculate the cost of realizing the major goals of our society. Along with the 15 major goals—including education, health, urban development, social welfare, and defense—outlined by President Eisenhower's Commission on National Goals,[27] the National Planning Association added space exploration as a 16th major program which has developed during the 1960's. Assuring an annual growth in gross national product of 4 percent, the NPA estimated that the cost of achieving the major goals of society by 1975 would exceed the projected GNP for that year by $150 billion, or 15 percent. Leonard A. Lecht, director of the NPA study, concluded:

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[25] "Approaches to the Reduction of Poverty," *Papers and Proceedings of the Seventy-seventh Annual Meeting of the American Economic Association*, May 1965, pp. 521–529; "Income Distribution and Poverty," in Margaret S. Gordon, ed., *Poverty in America* (San Francisco: Chandler Publishing Co., 1965), pp. 102–114; and others which are now in press.

[26] "Toward the Efficient Pursuit to Happiness," address before the National Association of Business Economists, Chicago, Oct. 1, 1965. *Business Economics*, winter 1965–66, vol. 1, No. 2, p. 11.

> We could well afford the cost of any single goal at levels reflecting current aspirations, and we could probably afford the cost for any group of goals over the next decade. We could rebuild our cities, or abolish poverty, or replace all the obsolete plant and equipment in private industry, or we could begin to develop the hardware to get us to Mars and back before the year 2000. We could make some progress on all the goals, perhaps substantial progress on many, but we cannot accomplish all our aspirations at the same time.[28]

It is not likely that society will decide in the foreseeable future to allocate the resources needed to win total victory over poverty, nor would excessive reliance upon transfer payments appear to constitute sound public policy. While allocation of additional income for the poor is an essential element in the war on poverty, simply raising income to fill even their minimum requirements would result in economic dislocations by eroding incentives to work. It may also be preferable in many cases to stress income in kind rather than in cash. This might apply to alcoholics and others afflicted with diverse maladjustments.

It is apparent that the waging of a successful war on poverty is a complex and costly undertaking. Even the 89th Congress, which is generally acknowledged as being the most welfare-conscious Congress in more than a generation, has not shown any inclination to commit the necessary resources to eliminate poverty in the immediate years ahead. As shown earlier, it has been particularly parsimonious in allocating additional income to the poor. Only about 2 percent ($150 million) of the multibillion-dollar 1965 amendments to the Social Security Act were allocated to raising Federal contributions to public assistance. Nor has the administration, which is committed to a total war on poverty, urged Congress to adopt programs which would raise the income level of the poor in the immediate years ahead. Whatever may be the merits of the varied income maintenance programs discussed above, there does not appear to be any wide consensus supporting their adoption. Although such a plan might receive serious consideration at some indeterminate future, to improve the lot of the poor in the short run we must realistically turn to more modest programs.

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[27] "President's Commission on National Goals," *Goals for Americans* (Englewood Cliffs, N.J.: Prentice-Hall, 1960).

[28] National Planning Association, *The Dollar Cost of Our National Goals* (Washington: The Association, 1965), p. 6.

Short-Run Priorities

If to do were as easy as to know what were good to do, chapels had been churches, and poor men's cottages princes' palaces.

WILLIAM SHAKESPEARE.

The needy shall not always be forgotten; the expectation of the poor shall not perish forever.

PSALMS 1:18.

The programs in aid of the poor reviewed in this summary carry an annual price tag of about $13 to $15 billion. The exact cost of these programs cannot be determined since many of the programs in aid of the poor are closely interwoven with general Government activity; but rough estimates can be made about the portion allocated to the poor on the basis of need. Other programs not discussed in this summary—aid to Indians, workmen's compensation, farm aid measures, and business loans, as they pertain to the poor, and other programs—would add another billion to the total cost. Private philanthropic efforts on behalf of the poor raise the total funds allocated in their aid by about another billion dollars. The total cost of programs is of little operational significance, since no adequate criteria exist to suggest what percentage of GNP, or even of governmental expenditures, should be allocated to the poor. The $11.5 billion poverty gap, noted earlier, is a poor measure, at best, since it ignores the costs of additional services and goods that should be made available to the poor.

The above rough estimate of resources allocated to the poor on the basis of need does, however, help to lend perspective to the recently much-heralded commitment for a war on poverty embodied in the Economic Opportunity Act of 1964. Assuming that all the funds appropriated under this legislation actually reach the poor—a questionable assumption—the Economic Opportunity Act increased the antipoverty funds by about 5 percent during its first year of activity; this amount was doubled during the second year.

It would be misleading, however, to measure the war on poverty solely in terms of direct expenditures. Minimum wage legislation, to which no price tag can be attached, may be a more significant tool in the war on poverty than the expenditures of billions under other programs, but its negative effect in causing disemployment cannot be measured. Some programs that may bring the greatest returns in the war on poverty may require little or practically no financial resources. Chief among these programs is an educational campaign to reduce, and possibly obliterate, discrimination practiced against minorities, particularly Negroes. The Voting Rights Act of 1965 may turn out to be a more important tool to secure equal rights for Negroes and thus to combat discrimination and poverty than other legislation involving huge expenditures.

Michael S. March, one of the administration's early architects of the current poverty program, has stated:

> Poverty has a formidable ally in our own ignorance of what we must do to root out poverty. When one stands "eyeball to eyeball" with poverty, preparing for mortal struggle, he will admit, if he is candid, that he does not know exactly what is best to do or how to do it.
>
> There is a surprising dearth of hard knowledge about the root causes and dynamics of poverty. . . . Our prescriptions for the cure of poverty are unsure and lacking in consensus.[29]

Yet the significant gaps in our understanding of the causes of poverty and the best means for eradicating its roots are no valid reason, as March argues, for inaction. We need not await returns from all the precincts to continue a vigorous campaign to reduce poverty. Lacking comprehensive knowledge for eliminating the roots of poverty, we can focus on specific programs which would aid selected groups among the poor. This suggested emphasis upon helping specific groups is not intended to supplant the generalized societal goal of eliminating all poverty. A free and affluent society should aim at nothing less. But we should realize this is an ultimate goal and only one among numerous and pressing demands upon society's attentions and resources. For the time being, more modest and specialized strategems should be selected with a view to achieving the ultimate objective. Grand designs for the good society have been avoided, not only because there is little evidence that society is ready to allocate adequate resources to a speedy reduction of poverty and because of the many pressing and competing goals faced by society, but also because the road leading to the millennium of a poorless society is not fully charted.

Even assuming that consensus can be reached on the amount of additional resources that need to be allocated for the war on poverty, it is not at all clear how these resources should be distributed. What share of any additional dollar should be allocated to raising the cash income of the poor as compared with improving the quality and quantity of services in kind? The poor are not a homogeneous mass. Additional income will provide for the basic needs of some; many others require services to enable them to enter the mainstream of our society. Until these special services and income in kind are adequate, it is premature to hope to achieve a rational guaranteed level of acceptable minimum income—whether this is to be achieved through negative income tax or other similar schemes.

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[29] "Poverty: How Much Will the War Cost?" *Social Service Review*, June 1965, pp. 154–155.

Major steps have been taken during the past year in the difficult and long journey whose goal is a poorless society. Whether all the programs will advance the journey is not yet known. The new antipoverty and related programs have strained the limited technical resources in the areas of social services and training. However, new programs and techniques developed by the Office of Economic Opportunity may provide for more efficient utilization of existing resources. For example, Head Start utilized unused school resources during the summer of 1965. Similarly, various projects stressing participation by the poor may expand services with hitherto unutilized resources. Judicious allocation of resources would suggest, however, the need of appraising the newly sponsored programs before additional funds are made available to OEO. The expected expansion in demand of medical care provided for in the 1965 legislation will more than exhaust available medical facilities and services. Any further major attempt to expand medical services to the poor during the next few years would, therefore, mean the redistribution of existing resources rather than an expansion of aggregate services.

A realistic program aimed at reducing poverty should therefore establish priorities and determine appropriate resources to be allocated. Leaving aside rhetoric about the elimination of poverty, it is assumed here that if society continues to increase resources allocated for alleviating poverty, say, at the cumulative rate of about 6 to 7 percent per year—about half as much as the anticipated growth of GNP—this would increase the antipoverty kitty by about $4 billion per year by the end of this decade. Given this modest, though far from negligible, short-term goal, the immediate question is which existing or new programs should claim priority for the additional resources.

Looking to the future, the most promising means of reducing poverty is to help the poor control the size of their families, a goal which can be achieved at negligible cost to the public. Primary emphasis should be placed on helping the impoverished to plan parenthood and thus reduce the number of unwanted children. However, the largest amount of expanded assistance would go to aid poor children, and to help create jobs for their parents.

It makes little sense to wage war on poverty without providing an adequate diet and other basic needs for millions of children who are being reared with an insufficient income. To repeat the social worker's slogan: "Services do not fill an empty stomach." Most observers would, however, agree that it would be preferable to provide income to impoverished families through the creation of jobs rather than through providing cash assistance. This would suggest the desirability of creating publicly subsidized jobs for parents of poor children, even though the creation of such employment may involve greater direct public outlays than mere cash assistance. Finally, in the area of providing goods to the poor, housing should claim top priority, not only because attainment of adequate shelter is outside the reach of most poor families but because outlays for subsidized housing would also help absorb general economic slack.

Planned Parenthood

> *The problem, everyone talks of it, is that of birth control. . . . It is an extremely grave problem. It touches on the mainsprings of human life.*
>
> —POPE PAUL VI.

The first priority in the war on poverty should be given to dissemination of education about methods of birth control, and, consistent with the religious beliefs of recipients, assistance should be made available to those who cannot afford private medical aid to plan parenthood. No major religious group in the United States is opposed to regulation of family size, though differences do exist on the methods permissible to achieve this goal and on the appropriate role of the State in this area. But without entering into the theological aspects of the birth control controversy, the views of Richard Cardinal Cushing are pertinent for the purposes of this discussion. He recognized the necessity for the State to follow, on occasion, a path which may differ from the views of a religious group, when he stated:

> Catholics do not need the support of civil law to be faithful to their religious convictions, and they do not seek to impose by law their moral views on other members of society.[30]

However, the official Catholic position on birth control remains unchanged. In October 1965, Pope Paul VI addressed the United Nations urging the representatives of the nations:

> You must strive to multiply bread so that its suffices for the tables of mankind, and not rather

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[30] U.S. Congress, Senate Committee on Government Operations, Subcommittee on Foreign Aid Expenditures, hearings, June 22, 1965, 89th Cong., 1st sess., on S. 1676 and related bills (Washington: U.S. Government Printing Office, 1965).

> favor an artificial control of birth, which would be irrational, in order to diminish the number of guests at the banquet of life.[31]

Broad support exists for dissemination of birth control information. In reply to a recent Gallup poll question: "Do you favor or oppose the distribution of birth-control information?" no less than 80 percent of Protestants, 60 percent of Catholics, and 84 percent of other religious groups answered in the affirmative.

With regard to the role of birth control in combating poverty, former President Eisenhower expressed the prevailing general attitude about Federal support of birth control when he wrote:

> I realize that in important segments of our people and of other nations this question is regarded as a moral one and therefore scarcely a fit subject for Federal legislation. With their feelings I can and do sympathize. But I cannot help believe that the prevention of human degradation and starvation is likewise a moral—as well as a material—obligation resting upon every enlightened government. If we now ignore the plight of those unborn generations which, because of our unreadiness to take corrective action in controlling population growth, will be denied any expectations beyond abject poverty and suffering, then history will rightly condemn us.[32]

One of the most tragic aspects of poverty is that many of the children born to poor families are unwanted. The National Academy of Sciences concluded that the poor have more children than affluent families because the poor "do not have the information or the resources to plan their families effectively according to their own desires."[33] The same study found that 17 percent of white couples and 31 percent of nonwhite couples had unwanted children in 1960. But among couples with the least education, and thus also likely to be poor, the comparative percentages were 32 percent for white couples and 43 percent for nonwhite couples.

Medical science has developed effective birth control methods that are within the means of poor families. Given the widespread desire on the part of poor parents to regulate the size of their families, birth control could be used as an effective tool to reduce future poverty. It is important that information about these methods and the necessary devices be made available to the general public without further delay because children born during the "baby boom" years are marrying and planning the size of their families. In 1960 there were 4.7 million women aged 18 to 21. Five years later their number increased to 6 million, and by 1968 it is expected that this figure will increase by another million.

With minor exceptions, Federal agencies have thus far avoided the funding of birth control programs. Even the Office of Economic Opportunity has shunned this controversial area. Only about 1 percent of the first 1,000 OEO-backed community action programs carried specific budgets for birth control programs.

It may be expected that the Federal Government will offer more positive support of birth control in the future. Katherine B. Oettinger, Chief, Children's Bureau, Department of Health, Education, and Welfare, declared recently that birth control services should be available to all as a matter of "right."

> . . . for it is the families of the poor who too long have suffered spiritual dejection and demoralization after bearing successive babies without hope of these children being able to achieve their full potential or breaking the cycle of poverty.[34]

Potentially more effective support of birth control programs came from President Johnson when he stated on June 25, 1965: "Let us act on the fact that less than $5 invested in population control is worth $100 invested in economic growth." The President did not specify the basis on which he made his estimates, but ample evidence exists to indicate the savings that accrue to the public as a result of family-planning services. For example, a birth control program initiated in Mecklenburg County, N.C., in 1960 was estimated to have saved $250,000 in AFDC benefits within 3 years.[35] Expenses involved in operating the program amounted to one-twentieth of the savings. Many other examples could be cited. The arithmetic is simple. Even considering the low cost of AFDC support, averaging just about a dollar a day, the few dollars expended per case on birth control saves the Government the cost of supporting an AFDC child for years to come, not to mention that it also reduces poverty.

Aiding Impoverished Children

> *The child was diseased at birth, stricken with hereditary ill that only the most vital men are able to shake off. I mean poverty—the most deadly and prevalent of all diseases.*
>
> —Eugene O'Neill.

If the current battle cry "break the chains of poverty" is not to become a hollow slogan, society must allocate additional resources to prevent the rearing of children in abject poverty and deprivation. The child from an impoverished home is likely to become a school dropout, an unemployable adult, and a perpetual relief recipient. Therefore, the next priority for any increased allocation of funds should go to helping poor children.

Though in need of radical overhauling, the AFDC program provides a suitable vehicle for this purpose. The nearly 1 million families, with about 3 million children, who are currently recipients of AFDC are among the neediest and most impoverished in the United States; therefore, they deserve the most immediate attention. The average income paid by the Government to AFDC recipients is about $1 a day. Since the minimum cost of food for a balanced diet is 70 cents per person per day and accounts for only a third of the basic needs, it is quite apparent that AFDC children exist on an inadequate diet, even if total food costs of young children are somewhat lower than the 70-cent average.

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[31] "Consensus Grows on Birth Control," Business Week, Oct. 9, 1965, p. 36.

[32] Hearings on S. 1676 and related bills, *op. cit.*

[33] National Academy of Sciences, *The Growth of U.S. Population* (Washington: The Academy, 1965), p. 10.

[34] Katherine B. Oettinger, "This Most Profound Challenge," *Congressional Record* (daily edition), Sept. 24, 1965, p. 24201.

[35] Jack Shepherd, "Birth Control and the Poor: A Solution," *Look*, Apr. 7, 1964, p. 67.

Before AFDC can be adopted as the main instrument for a decent relief system and as a rehabilitation tool, the program will have to be overhauled. Not only must the level of allowances paid to recipients be increased, but the method of distribution will have to be changed. The Veterans Administration pension system, described earlier, should be adopted as a model, since the VA experience has shown that the Government can offer assistance to needy persons without subjecting them to harassment or degradation. And, unlike the AFDC program, the Veterans Administration does not discourage initiative of recipients.

In most States earnings received by members of AFDC families are deducted from the total allowances the family is entitled to receive, allowing only minimal exemptions. The Economic Opportunity Act provides that the first $85 and half of additional monthly income earned under the provisions of the act (except work experience) are not to be counted as income for purposes of determining basic needs under public assistance programs. The 1965 amendments to the Social Security Act are less generous and permit States to disregard for purposes of benefit payments the monthly earnings of dependent children, not exceeding $50 per child or $150 per family. But the choice is left to each State; and if past experience is any indication of future action, most States are not likely to permit this exemption. In all but a few States the allowable exemption exceeds the total payments made by the State per child. AFDC as now operative in most States is not aimed at rehabilitating recipients or encouraging initiative and promoting self-respect. The resources of the system are concentrated on providing a substandard income, thereby leaving most recipients in abject poverty.

An effective AFDC program which does more than pay lip service to the rehabilitation of clients must also raise payments made to recipients. Even assuming that $600 per individual is the minimum income needed—and for a family of four this is 23 percent below the social security poverty threshold level of income—it would be necessary to increase current benefits paid to AFDC recipients by about two-thirds in order to reach this income level. This suggested figure takes account of free food distribution available to many AFDC recipients. Such a boost in the level of payments would also increase the number of eligible recipients. The few States which meet or approach the level of benefits suggested above would not have to raise their AFDC outlays.

To meet the proposed standards, AFDC expenditures would have to be raised by about a billion dollars. And expansion of coverage would possibly double the cost, though an effective birth control program would tend to reduce the number of children in impoverished households and decrease future costs. The 1965 social security amendments raise the maximum amount of Federal contributions to AFDC recipients by only $15 a year, and State action to match these benefits is required before the increased Federal grants can be paid to recipients. The miniscule increase in payments made possible by the 1965 Federal action indicates the resistance that exists in Congress and elsewhere to higher AFDC payments. State and local resistance may be even more difficult to overcome. The Federal share of contributions to AFDC will therefore have to be increased appreciably if an effective program is to materialize.

It makes little sense to spend $6,000 a year, and possibly more, to rehabilitate a Job Corps trainee while at the same time depriving children in impoverished homes of basic needs and thus assuring a supply of future Job Corps candidates. This is not to disparage the potential accomplishments of the Job Corps or other programs initiated under the Economic Opportunity Act, but it does suggest the serious gaps that now exist in the antipoverty program.

Job Creation and Work Relief

> *Anticipate charity by preventing poverty; assist the reduced fellowman . . . so that he may earn an honest livelihood, and not be forced to the dreadful alternative of holding out his hand for charity. This is the highest step and the summit of charity's golden ladder.*
>
> MOSES BEN MAIMON.

Creation of jobs for which the poorly educated and unskilled would qualify is the third on our list of priorities. After almost complete neglect of work relief programs during the past two decades, the Economic Opportunity Act provided for job creation under its work experience and youth employment programs. The continued high level of unemployment among the unskilled, particularly among Negroes, indicates the need for generating Government-supported jobs for those who cannot qualify for gainful employment in private industry. This does not mean that the Government should create make-work jobs.

Despite the gloomy forebodings of the prophets of cybernation, much of society's needed work is not being done; and the need is going to increase rather than disappear. Many of these jobs can be performed by relatively unskilled and unemployed workers. And the work can be found in rural areas and urban centers. Stream clearance, reforestation, and park maintenance are some of the simple traditional work relief jobs. Many new ones can be added, for example: School aids, health aids, simple maintenance jobs of public buildings, and renovation of slum areas. Medicare will not only expand the demand for services of physicians and technicians, but will also require the addition of many unskilled workers in hospitals and nursing homes.

The need for creating jobs for unskilled workers may become more pressing in the years ahead. Proposed congressional action boosting the statutory minimum wage by 75 percent within a period of 9 years, if it materializes in 1966, is likely to cause additional disemployment of unskilled workers. If no new jobs are created for these workers, relief will be the only method of providing income maintenance.

A major barrier to the creation of new public jobs for the unemployed is the determination of appropriate wage rates. Unions normally oppose the allocation of work, even when unskilled jobs are involved, at rates which undermine existing prevailing standards. Creation of these jobs is bound to be costly. A million dollars will buy no more than about 300 jobs, including some part-time jobs, paying modest wages and including cost of overhead and equipment. A program which will create 300,000 jobs, not an overambitious goal, is thus going to cost about $1 billion annually.

Housing

> *They turn the needy out of way; the poor of the earth hide themselves together . . . and embrace the rock for want of a shelter.*
>
> JOB 24:4–8.

Housing for impoverished families is given high priority because it is evident that adequate shelter cannot be provided by private enterprise at a profit, considering the rent that they can pay. It thus meets the generally accepted maxim of Lincoln that "the legitimate object of government is to do for the people what needs to be done, but which they cannot, by individual effort, do at all, or do so well, for themselves." The alternative to Government subsidization of housing for the poor is slums and dilapidated housing which, in turn, breed poverty. Adequate housing is, therefore, a major instrument in breaking the chains of poverty.

A continuing vigorous program of subsidized public housing would also act as an overall economic stimulant which would help decrease unemployment and expand job opportunities. Such a program is, therefore, a multipurpose tool in fighting poverty.

The great shortage of adequate housing available to the poor cannot be surmounted in the short run. It would require, even under the most conservative estimates, an investment in excess of $30 billion to eliminate substandard housing. The principle of housing subsidies has already been accepted, as witnessed by congressional action in 1965. The question now is how rapidly the program is to be implemented. A constraining factor should be the extent to which underutilized resources, both human and physical, are available for the purpose of building housing. This is not to suggest that construction of housing for the poor is inherently of low priority compared with the supply of other consumer goods. Most consumer goods are produced in the free market and are not subject to Government regulation. A vigorous implementation of public housing during a period of shortages would intensify inflationary pressures, particularly in the field of housing construction where boosts in wage costs have tended to exceed increases in productivity. Since construction of subsidized housing is subject to Government control, the degree of priority assigned to this program is diminished if it is to be undertaken at the risk of intensifying inflationary pressures.

Under the conditions that prevailed in the country between 1958 and 1964, expansion of housing for the poor could have been vigorous and rapid. With developing labor shortages and increased commitments to expand defense activities, subsidized housing expansion must be more moderate and selective. However, the level of unemployment and the amount of utilized plant resources still remain high in many areas where additional construction activity could absorb some of the existing economic slack.

Since the supply of adequate housing for the poor will remain necessarily far short of need, priority in allocating the limited supply should be given to the working poor. This judgment is not based necessarily on the assumption that the working poor are more "deserving." It is advanced because pragmatic considerations favor the working poor for the allocation of subsidized housing. Public housing has been criticized on the basis that it subsidizes the indolent, but this argument could be minimized if the bulk of subsidized housing were allocated to the working poor. Even opponents of the welfare state find it difficult to argue against helping the "deserving" poor.

Is Business "As Usual" Feasible?

> *If there be among you a poor man, . . . thou shalt not harden thine heart, nor shut thine hand from thy poor brother . . . and shall surely lend him sufficient for his need, in that which he wanteth.*
>
> DEUTERONOMY 15: 7–8.

The cumulative addition of a billion dollars a year in aid of the poor during the next 4 years will only alleviate poverty for some, and large segments will hardly benefit by the programs outlined above. Included in these groups are more than 5 million persons aged 65 and over, and most of the 4 million families headed by gainfully employed, unemployed, or underemployed workers. The aged group has been aided by the passage of Medicare and the boost in social security benefits, but much more will have to be done to raise the income of the aged poor to the poverty threshold. To improve the lot of the poor in the work force, reliance is placed on the achievement of full employment, job creation, and protective wage legislation. Though the achievement of full employment is a sine qua non in the war on poverty, it was not discussed in this paper because this goal is essential to the achievement of many of society's aspirations. Sustained full employment will not only absorb many of the unemployed poor in the work force but should also raise their level of income.

It would take the absorption of more than 3 million poor into the work force to achieve the same proportion of gainfully employed among the poor as among the nonpoor. Given the educational, demographic, and other impediments of the poor, such conditions cannot be achieved even with full employment. It is questionable whether sustained full employment can be maintained in the next few years—assuming that it will be achieved at all before the end of this decade.

In brief, the anticipated allocation of an additional $1 billion a year in aid of the poor assumes that society will stop short of assigning top priority to the war on poverty and that the goal of accelerating the reduction of poverty will remain one of several societal aspirations, competing for available limited resources. It represents only a modest effort in combating poverty and will result in little redistribution of income. It is not at all clear that such a situation will remain tenable in the years ahead in face of widespread Negro unrest and the commitment of the Great Society to eliminate poverty. Half of the Negro population lives in poverty, compared with one of every seven whites. It is likely that the civil rights movement is going to stress even more the attainment of broader economic opportunities for the Negro population. And recent incidents indicate that some sectors of the Negro population are not inclined to rely exclusively upon orderly procedures to achieve a greater measure of economic and political equality. Society may find it necessary, therefore, to allocate far greater resources in aid of the poor than was anticipated in this bulletin.

MANPOWER ADJUSTMENTS TO AUTOMATION AND TECHNOLOGICAL CHANGE IN WESTERN EUROPE

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CONTENTS

Page

Chapter 1. Comparative analysis: Five West European countries and the United States III–47
    Some factors affecting technological development 47
    The rate of economic growth and technological development 48
    Comparison of computers installed in West European countries 52
    Labor force trends and changes in employment structure 53
Chapter 2. Great Britain 56
    British management 56
    Worker and trade union attitudes toward technological change 57
    Redundancy policies 59
    Collective bargaining 62
    Government programs 63
Chapter 3. France 72
    Influence of management and government on technological development 72
    Manpower policy and French planning 73
    Industrial and regional employment trends 75
    Regulation of dismissals and layoffs 77
    Unemployment insurance and old-age pensions 79
    Government manpower programs 80
Chapter 4. West Germany 86
    Factors influencing technological development 86
    Changes in employment structure 87
    Collective bargaining 90
    Effect of codetermination laws 92
    Government programs 93
Chapter 5. Sweden 101
    Factors affecting technological development 101
    Employment structure 102
    Collective bargaining 104
    Labor market policy 106
Chapter 6. The Netherlands 115
    Factors affecting technological progress 115
    Attitudes towards unemployment, work, and leisure 116
    Collective bargaining 118
    Government manpower programs 119
Chapter 7. Conclusion 121

Manpower Adjustments to Automation and Technological Change in Western Europe

Chapter 1. Comparative Analysis: Five West European Countries and the United States

In a recent volume on *Adjustment to Technological Change*, the editors ended their concluding chapter with the following statement:

> . . . it is apparent that Europe has shown a tendency to innovate and has accomplished much in dealing with problems of adjusting to technological change. Although differences in American labor market conditions would probably require adaptation of programs developed in Europe, much can be learned from social experiments abroad.[1]

The National Commission on Technology, Automation, and Economic Progress must have been thinking along similar lines when it decided to have a study made of manpower adjustments to automation and technological change in a number of European countries. The primary interest was in manpower problems under conditions of full employment—a situation which, hopefully, the United States will attain in the near future.

Limitation of time precluded the kind of exhaustive study that would be warranted by the wealth of material on each of the countries covered in this paper. Fortunately we are not completely ignorant of what European countries have been doing in the manpower field as a result of some excellent studies by the U.S. Department of Labor, International Labor Organization, Organization for Economic Cooperation and Development, university scholars, and the Senate Subcommittee on Employment and Manpower. With these studies as background we have tried to emphasize recent developments, some aspects of manpower adjustment that may not have been covered in previous work, and expectations for the next decade. This paper deals with five countries in Western Europe: Great Britain, France, West Germany, Sweden, and the Netherlands.

Insofar as possible we have tried to cover the same subjects in each country: The rate and extent of technological development; employment effects of changing technology; attitudes towards technological change on the part of unions, employers, and government; collective bargaining and automation; and government programs in the manpower field. The amount of material gathered on each subject varied from country to country: In some countries little or no information was available on some subjects; in others we varied our outline to include subjects of particular significance in those countries.

We tried in each country to meet with representatives of government, industry and labor, and scholars working in the manpower field, and to collect available written material, published and unpublished. We tried to overcome the language barrier by using interpreters and translators where necessary. Nonetheless, there remains much material which we have not yet been able to utilize because it was not in English and translation assistance was not readily available.

Some Factors Affecting Technological Development

Western Europe presents a quite different manpower picture than the United States. The United States has a rapidly increasing labor force which has grown by 14 percent in the last decade and is expected to grow 20 percent more by 1975. West European countries, on the other hand, have increased their active population by only 7.5 percent since 1955 and expect to grow only 4 percent in the next decade.[2] Unemployment is almost nonexistent in a few countries, and does not exceed 3 percent in any of the industrialized nations; in the United States, at 4.3 percent (as of October 1965), unemployment is lower than at any time since 1957.

Countries in Western Europe have tried to deal with their manpower shortages in a variety of ways. Foreign workers are being used more than ever before. In 1964 there were over 4 million workers employed in countries other than their own: 1.5 million in France (8 percent of the labor force); 1 million in Germany (4 percent of the labor force); 820,000 in Switzerland (30 percent of the labor force); 140,000 in Sweden (3.5 percent of the labor force); and 45,000 in Holland (1 percent of the labor force).[3] Of the countries studied, France and Germany expect to increase employment of foreign workers in the next 5 years, Sweden and the Netherlands will probably not go much beyond present levels, while Great Britain is trying to limit immigration. All countries are trying to increase the participation rate of women, and particularly of married women, where the greatest labor reserves are to be found.

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[1] E. Cushman, G. Somers, and N. Weinberg (eds.), *Adjusting to Technological Change*, Industrial Relations Research Association, Harper and Row, 1964, pp. 219–220.

[2] "Shorthanded Europe," *Fortune*, June 1965.

In the past, European countries have depended heavily on their labor reserves in agriculture to help meet shortages in the growth sectors of the economy. Between 1950 and 1960, 6 million workers—one-third of the total increase in industry—moved from agriculture to industry, resulting in a decrease in agricultural workers from 26 percent of the total labor force to about 17 percent. All countries will continue to draw on farm labor to meet shortages in industry and in the services, but this source is rapidly drying up and has already been pretty well exhausted in such countries as the Netherlands, Great Britain, and Sweden, where only a small proportion of the labor force is to be found in agriculture.[4]

Increasing the utilization of older workers by delaying retirement age is not likely to be a significant source of labor supply during the next few years; if anything, the trend seems to be in the other direction. In this connection, it is interesting to note that the labor force participation rate of men and women over 65 years of age is higher in the United States than in any of the five West European countries studied, despite the fact that ostensibly we have less need for their services.[5]

At the other end of the population spectrum, compulsory school age is being raised and more students are being encouraged to attend institutions of higher education in all countries, decreasing the supply of new entrants into the labor market.

Manpower shortages will be made more acute in some countries by reduction of the standard workweek, which is being sought by unions and is expected to be granted some time within the next 5 years. While this may increase the amount of overtime work at premium rates, total hours worked per week is likely to decrease.

As manpower becomes more scarce in relation to requirements, the search for substitutes in the form of machinery and more advanced technology is pursued more energetically. An additional impetus to technological change has been provided by rapidly rising wage rates. In recent years wages in Western Europe have been increasing at an annual rate of 8 percent for factory workers. This is in excess of the increase in productivity, which has been going up at a rate of about 4 percent per year for Western Europe as a whole, though some countries have experienced an even greater rise in output per worker in recent years. In the United States wage rates have been increasing at a much slower rate, but productivity increases have also lagged behind Europe.

In view of these factors, West European countries will, in the next decade, depend much more on increasing productivity to maintain or increase their rates of economic growth upon which rising standards of living depend. Such increases can only be achieved by the fullest use of automation and advanced forms of technology wherever it is technically and economically feasible. While the use of automation in Western Europe is in its early stages and far behind the United States, all countries expect the adoption of advanced technology to proceed at an accelerated rate in the next decade. Indeed many manpower specialists believe that technological change in Western Europe has been proceeding at a more rapid rate than in the United States for some time and will continue to do so in the future.[6]

The Rate of Economic Growth and Technological Development

Technological progress is an elusive concept which cannot be readily measured. In its broadest sense technological or technical progress (used interchangeably in this paper) covers all the ways in which advances in knowledge promote economic growth. In the narrower sense technical progress refers to "the application of science to industry, and consists in technical innovations—the introduction of new or improved processes (requiring fewer or cheaper inputs per unit of output) and of new or improved products: Increased mechanization and automation exemplify the former, plastics and jet aircraft the latter."[7] Perhaps the most widely used measures of technical progress are the rate of economic growth of a country and, more important, the contribution of labor productivity to that growth. Table 1 shows growth rates of output, labor force, and labor productivity for the five European countries studied and the United States for the 1950's and the period 1959–63.

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[3] *Ibid.*

[4] *Ibid.*

[5] *Yearbook of Labor Statistics*, International Labor Organization, Geneva, 1964.

[6] *Adjusting to Technological Change, op. cit.*, p. 190.

[7] *Some Factors in Economic Growth in Europe During the 1950's*, Economic Survey of Europe in 1961, part 2, Economic Commission for Europe, Geneva, 1964, chap. V, p. 1.

TABLE 1. GROWTH RATES OF OUTPUT, LABOR FORCE, AND LABOR PRODUCTIVITY 1949–59 AND 1959–63 [1]

Country	Gross domestic product		Labor force		Labor productivity	
	1949–59	1959–63	1949–59	1959–63	1949–59	1959–63
France	4.5	5.8	0.1	0.7	4.3	5.1
West Germany	7.4	5.4	1.6	.8	5.7	4.6
Netherlands	4.8	5.2	1.2	1.4	3.6	3.7
Sweden	3.4	3.8	.5	1.2	2.9	2.6
United Kingdom	2.4	2.6	.6	.9	1.8	1.7
United States	3.3	3.6	1.2	1.2	2.0	2.4

[1] Labor productivity refers to the average annual increase in output per person in the labor force, including military personnel. This means that the figures may be affected by changes in the level of unemployment, the number of men in the armed forces, and hours worked per year. Output per man hour in the United States during the periods indicated was higher than the figures shown in the table. However, in order to maintain comparability between countries, productivity per person was used.

SOURCE: *Some Factors in Economic Growth in Europe During the 1950's*, Economic Commission for Europe, Geneva, 1964, chap. VII, p. 13. U.S. figures for 1959–63 calculated using methods employed in ECE report.

Table 1 indicates that economic growth has proceeded at a more rapid rate in four of the five countries studied than in the United States, both during the 1950's and in the early years of the 1960's. Only the United Kingdom has lagged behind the United States in terms of growth in gross domestic product. West Germany's growth in the 1950's was phenomenal, outstripping all other West European countries and running far ahead of its closest competitors—the Netherlands and France—among those included in this study. The situation changed somewhat during the period 1959–63, with France drawing ahead of both West Germany and the Netherlands; Sweden and the United Kingdom improved slightly on their growth rates during the 1950's but still lagged far behind the other three countries. The United States also increased its rate of growth during 1959–63 as compared with the previous decade, but still ranked a little behind Sweden and substantially ahead of the United Kingdom.

If we separate the contributions to the growth rate of increments in the labor force and increases in labor productivity, the picture changes somewhat. Both West Germany and the Netherlands benefitted considerably from the relatively large growth of their active populations during the 1950's as compared with the other three European countries. France, in particular, with almost a stationary labor force, had to rely almost entirely on the increase in labor productivity to raise its output of goods and services. Sweden and the United Kingdom also gained from growth in their active populations though not as much as either Germany or the Netherlands. Thus if technical progress is equated with labor productivity, France must be ranked well ahead of the Netherlands during the 1950's and West Germany's advantage is cut in half over its nearest competitor. The United States' 2-percent increase in labor productivity drops it further behind Sweden than it was in terms of the rate of economic growth; but the United States remains somewhat ahead of the United Kingdom. While the American labor force increase of 1.2 percent was not as high as West Germany's, it accounted for a much larger proportion of total economic growth than in any of the five European countries.

During 1959–63 all five European nations experienced substantial increases in their labor force, and the ranking was the same whether economic growth or productivity increase is used as the relevant measure of technical progress. The United States increased output per person by 2.4 percent during 1959–63, maintaining its position ahead of the United Kingdom but behind the other four countries.

To a very large extent technical progress in industrialized countries is embodied in the installation of new and improved capital equipment. Conversely, almost all fixed investment—even widening and replacement—incorporates some improvement in the quality of equipment; i.e., some technical progress. Hence there is a close association between the rate of capital formation and technical progress, and much of the increase in labor productivity is associated with modernization of plant and equipment. In trying to assess the rate of technical progress of a country, we must therefore look at the extent to which it has been investing in new and replacement capital equipment. Figures from the ECE report show the rate of investment as measured by the share of gross fixed capital formation in gross domestic product (table 2).

Table 2 shows that West Germany and the Netherlands had relatively high rates of capital formation during the 1950's and also during the more recent 3-year period. This is consistent with the high growth rates achieved by these two countries as shown in table 1. The relatively low investment ratio of the United Kingdom during the 1950's is also not surprising in view of its low growth rate. The higher rate during 1959–62 does

TABLE 2. INVESTMENT RATIOS, 1949–59 AND 1959–62 [1]

Country	1949–59	1959–62
France	20.6	21.7
West Germany	24.2	23.9
Netherlands	25.0	26.1
Sweden	21.4	24.3
United Kingdom	16.1	19.3
United States	18.1	(1)

[1] The 1959–62 investment ratio for the United States was not given in the ECE report and since we were unable to determine the exact method used, we did not attempt to calculate the U.S. figure.

Source: *Some Factors in Economic Growth in Europe During the 1950's*, Economic Commission for Europe, Geneva, 1964, chap. VII, p. 13.

not show up either in overall economic growth or labor productivity for the period but may be reflected in later years. The same might be said of Sweden, which in 1959–62 had a higher investment rate than any of the other countries except the Netherlands, but ranked fourth in both the rate of growth and productivity. The U.S. investment ratio of 18.1 percent during the 1950's was relatively low as compared with the other countries and consistent with its position in terms of growth and productivity.

France presents the most surprising picture, with relatively low investment ratios and high growth and productivity rates during both periods. A rather uneven relationship between rates of growth and investment ratios was also found for 22 Western European countries included in the ECE Report, although there was a fairly strong association between these variables for the 13 industrialized countries, excluding Norway. The ECE Report has analyzed in detail the growth trends during the 1950's in three of the countries included in our study—West Germany, France, and the United Kingdom—and makes the following points which help to explain the differential rates of growth in these countries.[8]

West Germany

1. Population in the 1950's increased by 4.8 million, or 10 percent, net immigration providing almost half the increment due to the large influx of refugees from East Germany.
2. The immigrant manpower was of high quality, including many qualified tradesmen, technicians, and professional experts, all favorable to economic growth. The labor force rose by 3.4 million, or nearly 16 percent, and employment by 23 percent. Unlike most other West European nations, West Germany entered the 1950's with high unemployment—7.3 percent of the labor force—which was almost completely eliminated by 1960, when the unemployment rate was 0.9 percent.
3. Not only was the West Germany investment ratio one of the highest in Western Europe, but the volume of gross fixed investment increased by 130 percent from 1950 to 1959, compared with 45 to 60 percent in the Netherlands, France, Sweden, and the United Kingdom. Moreover, in contrast with most Western European countries, there was only one halt in investment growth during the decade.
4. Rapidly growing exports, low dependence on imports, American and other aid, and U.S. military expenditures toward the end of the decade all served to establish West Germany in an unassailably strong balance-of-payments position.
5. As a result of large and sustained investment, the age structure of capital stock which had deteriorated in the depression, and during the war and early postwar years, became very favorable. In 1957, 30 percent of all industrial buildings and 43 percent of equipment were less than 5 years old.
6. Technical progress and innovation made a considerable contribution to economic growth. Compensation for wartime destruction involved a simultaneous introduction of efficient, up-to-date machinery and equipment, while the high rate of capital formation also incorporated technical innovations accumulated and applied elsewhere. U.S. technical assistance enabled German industry to benefit from the "best practice" methods and technical knowledge in the United States. The German Government encouraged industrial research, and research expenditures increased by 90 percent between 1955 and 1959. The net effect was a burst of modernization during the investment boom of the fifties.
7. There is almost certain to be a decline in growth during the 1960's now that some of the special factors noted above have ceased to operate or have become less powerful. In many respects West Germany is now in a phase where its basic conditions for growth resemble more closely those prevailing in some other industrial countries of Western Europe during the postwar period, with labor shortages and rising wage-price costs impeding a high rate of expansion. Future progress will depend increasingly on the maintenance of high-level, laborsaving investment and on technical progress.

France

1. Despite the negligible growth rate of the labor force, interindustry labor mobility in France was substantial during the 1950's. Of particular importance was the exodus of labor from agriculture and the textile industry to other higher productivity branches of the economy.
2. The rapid growth of labor productivity in French manufacturing during the 1950's was greatly facilitated by its "technological backlog" at the start of the period in relation to other Western European countries. Moreover, the prevalence of small enterprises in France and a general absence of specialization were both conducive to a relatively low level of technology. This technological backlog at the beginning of the decade meant that the increase in the productivity of capital stock resulting from replacement investment was particularly large.
3. From the inception of the Second Plan for Modernization and Equipment (1954–57), French industrialists and government officials were preoccupied with increasing productivity. In sharp

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[8] *Ibid.*, chap. VI.

contrast to prewar attitudes, political and economic opinion was firmly growth-oriented during the postwar period. The necessity to raise the level of efficiency may also have been more readily accepted by French workers, who had not had to endure the astronomical levels of unemployment during the 1930's experienced in the United States and most other West European countries. Secondly, it was clear to industrialists that increased efficiency was essential because they were no longer to be protected by the high trade barriers of the prewar years, and outside competition would be intensified as a result of the Common Market.

4. The Government took an active role in the drive to increase productivity. A national committee on productivity was established in 1950, and in 1953 all official activities relating to productivity were grouped into a General Commission on Productivity, which later became an instrument of the Planning Commission. Productivity questions became increasingly the concern of the various commissions, set up under the planning authority, which were charged with the preparation of production programs for individual sectors and branches of the economy. The commissions were particularly useful for those industrial branches with a multitude of small- and medium-size enterprises, which most needed modernization and rationalization but were unable to achieve it without outside guidance. The simultaneous preparation of production targets for various branches of the economy and their synthesis into a consistent national plan helped to avoid big mistakes in framing investment policy from the enterprise to the national level.

5. Aggregate demand was consistently strong throughout the decade, tending to support confidence in future growth and encourage intensive utilization of productive resources, including labor. Government policies were generally such as to permit domestic expansion to proceed unchecked even at the cost of rapid price inflation, balance of payments difficulties, and currency devaluation.

The United Kingdom

1. Economic growth has been slow and erratic partly because the authorities have frequently had to sacrifice steady and rapid demand expansion for other objectives. The climate of expansion created in West Germany and France was never created to the same extent in the United Kingdom. Had it ever been possible to give free rein to expansionist tendencies for more than 2 or 3 consecutive years, the result might well have been a shift to a somewhat higher rate of investment and the achievement of a more rapid rate of growth. The cumulative process of strong aggregate demand stimulating maximum exploitation of productive resources, optimistic expectations, high investment, further rapid economic growth, and continuing strong investment demand have never really become established in the United Kingdom. While there are many reasons for this state of affairs, the contribution of the balance of payments was among the most important as well as being peculiar to the United Kingdom.

2. Some of the special factors making for high rates of economic growth in West Germany and France were not present in the United Kingdom. Partly as a consequence of less economic disruption and damage as a result of the war, the prewar peak level of output was regained in the United Kingdom before the start of the fifties. Consequently there was less possibility of increasing the productivity of capital stock by relatively minor additions or replacements, or by small improvements in the flow of materials. Nor had there been so significant a lag in technological development before the war as in France and West Germany, where the prewar economies had been even more insulated from external competition than the British economy.

3. The rigidity of the employment structure contributed to the very low rate of labor productivity increase. Changes in the shares of the major sectors in total employment were smaller than in most other countries and contributed little or nothing to the rise in labor productivity in the economy as a whole.

4. One important factor retarding labor mobility between branches and even between firms has been the attitude of labor and management to redundancy. Whenever demand has slackened both have preferred short-time work and reduced overtime over releasing part of the labor force. This hoarding of labor has been practiced by management because of its assumption that, regardless of the slow rate of growth, full employment was assured as a matter of public policy. They feared that labor once lost would no longer be available when demand again became adequate and capacity production was resumed. As for trade unions and workers, fears of redundancy have persisted despite the generally strong demand for labor during the postwar years and the acceptance by all parties of full employment as a major objective of public policy. Consequently restrictive practices hampered the growth of productivity and sometimes even the full utilization of capital equipment. The fear of redundancy, while not readily explainable on rational grounds, has its source in a variety of factors: Memories of the dismal 1930's, the recurrence and persistence of significant unemployment in some areas, and the absence of generous redundancy payments. Housing shortages and inadequate retraining facilities have impeded geographical and occupational mobility.

5. Industry too has been guilty of restrictive practices which have kept prices up and prevented genuine competition. Many of these practices have been brought into the open or abandoned as a result of the work of the Monopolies Commission and the Restrictive Practices Court; but even when collective price agreements have been banned, British businessmen still do not cut prices because of a widespread belief that markets are inelastic and price wars expensive.

6. Growth in the British economy proceeded during the 1950's in fits and starts. Investment had to be restrained at times in order to improve the balance of payments either directly, by limiting the growth of imports and releasing resources for export, or indirectly, by checking cost-price inflation. The balance of payments problem was composed of two major elements: The failure of commodity exports to rise fast enough to keep pace with the rising demand for imports to compensate for declining net income from invisibles, and to cover long-term capital exports, foreign aid, and debt repayment; and the vulnerability of sterling as an international reserve currency. This made it difficult or impossible either to permit a prolonged drain on exchange resources as the price of expansion, or readily to contemplate exchange-rate devaluation as a normal instrument of policy to be used if domestic and external price trends diverge drastically. In this respect the United Kingdom position is unique in Western Europe.

Comparison of Computers Installed in West European Countries

The foregoing analysis has been concerned entirely with the *rate* of economic growth and the various factors, including technical progress, which may have influenced this rate. It tells us little, however, about the *level* of technological development in the various countries. The problems of manpower adjustment are related to both the rate of technological change and the level at which such change occurs. There are no reliable indicators which may be used to compare the general level of technology in different countries. The problem is made more difficult by the fact that there may be great differences in technological development of different industries within countries. In one area, however—the use of office computers—it is possible to make a rough comparision of the technological development of different countries.

The Netherlands Automatic Information Processing Centre has estimated the number of computers installed in the Common Market and other West European countries, as shown in table 3.

TABLE 3. COMPUTERS INSTALLED IN SELECTED COUNTRIES AND RELATIONSHIP TO NONAGRICULTURAL LABOR FORCE, IN 1960 AND 1961[1]

Country	Computers installed		Per 1 million nonagricultural labor force	
	1960	1961	1960	1961
Belgium	37	65	12	20
Germany	190	390	9	18
France	166	260	11	17
Italy	89	200	6	13
Netherlands	40	70	12	20
EEC	522	985	9	17
Great Britain	240	340	10	15
Norway	5	10	5	9
Sweden	37	70	14	28
Denmark	1	10	1	6
Switzerland	31	70	16	35
Austria	12	25	5	10
Total West Europe	848	1,510	9	17
United States	4,718	7,445	75	118

[1] In the absence of an acceptable common measure in which to express the capacity of various types of computers, the Netherlands Centre has compared the number of computers installed in different countries without regard to differences among them.

SOURCE: *Development of the European Computer Market*, report delivered by the Netherlands Automatic Information Processing Research Centre by request of the Committee of the European Economic Community, June 1963.

Table 3 shows that West Germany replaced Great Britain as the largest user of computers in 1961, with France third. More significant, however, is the number of computers installed in relation to the labor force, exclusive of agriculture. Here we find that in 1961 computers were being used most intensively in Switzerland, followed by Sweden; all the other West European countries lagged far behind the two leaders. Great Britain, which in 1955 was the first European country to install computers, had a lower intensity of computer use in 1961 than any of the Common Market countries except Italy. The contrast between the United States and the Common Market countries is remarkable, taking into account the small difference in population between the two entities. However, it is interesting to note that the rate of increase in computers installed at the end of 1961 as compared with 1960 was more rapid in all European countries, the Common Market countries, and in almost all individual countries, than in the United States. Germany, Italy, Sweden, Denmark, Switzerland, and Austria increased their intensity of computer use by 100 percent or more, as compared with only a 60-percent increase in the United States. However, in absolute terms, the U.S. increase amounted to more than four times the number of computers installed in all Western Europe. By the end of 1962 the United States had 9,500 computers installed. The Netherlands Centre study estimated that the Common Market countries would reach this level in about 1970, marking a lag of 8½ years between the two entities in terms of this one measure of technological development. Elsewhere, the authors of the Netherlands Centre report have taken the view that the European lag is partially offset by "the more sophisticated utilization of computer installations in Europe" as compared with the United States.[9]

Although other forms of technical change do not lend themselves even as well as computers to quantitative international comparison, there was wide agreement among people we interviewed that Western Europe is far behind the United States in the use of automation and technological advances. A common estimate was: "We are about 10 years behind the United States." At the same time, the view persists that technology is progressing at a more rapid rate in Western Europe than in the United States. This view is most strongly held in West Germany and Sweden, the two countries generally acknowledged to be in the forefront of technological advance in West Europe.

Labor Force Trends and Changes in Employment Structure

All the countries studied have had relatively full employment throughout the 1960's. Only West Germany has had a unemployment rate in excess of 3 percent during any of the last 10 years, and all five countries have been more concerned over labor shortages and "overheating" the economy than about excessive unemployment. The labor force in each of these countries, while generally increasing at a more rapid rate during the last 5 years than in the 1950's (except for West Germany), has been growing more slowly than in the United States. During the next 5 years, the contrast with the United States will be even greater, with all five countries expecting a reduced rate of increase in the labor force while the U.S. labor force is expected to grow at an average rate of 1.8 percent per year (table 4).

In this context one would not expect to find any great concern in Western Europe over the impact of automation and technological change. And this is indeed the case. Even the trade unions do not claim that changing technology has caused unemployment in their own countries. Persons with whom we spoke are, of course, aware of the relatively high unemployment in the United States, but doubt that it has been caused by automation. They are more inclined to blame our Government's order of priorities which, in their view, puts price stability ahead of both economic growth and full employment rather than the other way around, as in most European countries.

TABLE 4. CURRENT LABOR FORCE AND PROJECTIONS TO 1970

Country	Civilian labor force[1] (millions)	Rate of increase			Unemployment rate 1964[5]
		1950's[2]	1959–63[3]	1964–70[4]	
France	19.3	0.1	0.7	0.6	1.5
West Germany	25.6	1.6	.8	.3	.7
Netherlands	4.3	1.2	1.4	1.2	.8
United Kingdom	25.0	.6	.9	.4	1.7
Sweden	3.8	.5	.9	.3	1.1
United States	74.2	1.2	1.3	1.8	5.2

SOURCES: [1] United States—1964, from *Manpower Report of the President*, 1965; France and West Germany—1963, United Kingdom and Sweden—1962, Netherlands—1961, from *Basic Statistics of the Community*, Brussels, 1964.

[2] *Some Factors in Economic Growth in Europe During the 1950's*, Economic Commission for Europe, Geneva, 1964.

[3] United Kingdom, Netherlands, France, West Germany, from Economic Commission for Europe study, *op. cit.*; Sweden—1960–65, from Finance Ministry; United States—1960–65, from *Manpower Report, op. cit.*

[4] United Kingdom—1963–73, from *Manpower Studies No. 1*, Ministry of Labour; Netherlands, France, West Germany—1964, from *France, Fifth Plan*; Sweden—1965–70, from Finance Ministry; United States, from *Manpower Report, op. cit.*

[5] All countries except France, from *Bull. of Labor Statistics, 1965*, 2d Qtr., ILO, Geneva; France, as of 1963, from *Basic Statistics of the Community, op. cit.*

A Swedish employer representative put it this way:

> Technical development in itself probably does not create unemployment. A person who loses his job as a result of a technical change and is unable to get a new one is not unemployed because of the technical change but because he lives in a society that cannot maintain full employment.[10]

Most of the people we talked with would probably agree with this statement.

Full employment in Europe is much more stringently defined than in the United States. No one, including those who felt that an increase in the country's level of unemployment would be good for the economy, considered that unemployment above 3 percent was consistent with a full employment economy. Most would put the figure closer to 2 than 3 percent, and some thought that when unemployment exceeded 2 percent a country no longer had full employment. It is interesting to note that the new French Fifth Plan considers an unemployment rate of 2.5 percent or more to be an indicator of excessive slowdown in the economy which calls for remedial action.[11]

When asked what would happen in their country if unemployment were to exceed 3 percent for more than a few months, typical replies were:

> The United Kingdom could not accept unemployment as high as 3 percent; productivity would fall due to shorter runs and reduced operations. Management is against higher unemployment because it associates unemployment with reduction in demand. (Trade union representative)

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[9] A. B. Frielink and B. Scheepmaker, "Technological Advance in the Common Market Countries," in *Employment Problems of Automation and Advanced Technology: An International Perspective*, J. Stieber, ed., Macmillan and Co., London, pub. scheduled for 1966.

[10] "The Adjustment Process for Individuals," statement on behalf of Swedish Employers' Confederation, North American Joint Conference on the Requirements of Automated Jobs and Their Policy Implications, Organization for Economic Cooperation and Development, Washington, D.C., 1965 (mimeo).

[11] *Le Monde*, Paris, July 31, 1965.

> In France full employment means less than 2 percent; 3 percent unemployment would mean a crisis. (Government official)

> Unemployment [in France] of 3 to 4 percent would result in demonstrations against the state and a threat to law and order; the church would support the people and the state would have to act. (Professor)

> Full employment means about 1½-percent unemployment. Three percent or more unemployment would result in political unrest. (Labor director of West German steel company)

The Swedish National Labor Market Board, responding to an OECD questionnaire, said:

> In Sweden all parties concerned, the authorities, the employers and trade unions, endorse the idea of full employment as a primary aim of economic policy and a means of increasing the standard of living. On the other hand unemployment, however slight, is not tolerated in the society of today.[12]

Full employment has been achieved in Western Europe within a framework of structural changes in employment which are similar to those which have occurred in the United States (see table 5).

During the period 1950–62 agricultural employment declined substantially, both in absolute numbers and as a percentage of total employment. The decline was largest in West Germany, but exceeded 20 percent in all countries, including the United States. (Comparable figures were not available for Sweden. However, employment trends there were similar to those in other countries.) (See chapter 5.) Employment in mining also decreased in France and the United Kingdom, both absolutely and relatively, as it did in the United States. The picture would be the same in West Germany if mining figures were not lumped together with manufacturing and other industries which showed large employment increases. In the Netherlands there was an absolute increase in mining employment, all of which occurred in the early 1950's, but a slight decline in relation to total employment.

There was more variation among countries in other industries. Employment in construction, commerce, and services rose more than proportionately in relation to the total labor force in West European countries as well as in the United States. The gain in construction in Europe tended to be larger than in the United States, while the employment increase in services was rather less than in the United States. Manufacturing employment increased more slowly than the total labor force in the United Kingdom and in the United States, and transport, storage, and communications showed almost identical declining trends in these two countries. In France, Germany, and the Netherlands, virtually all industries except agriculture and mining increased employment.

Within the branches of manufacturing there were important shifts in employment. Textiles was by far the largest loser of employees in all countries, while timber and stone either showed actual employment decreases or increased proportionately less than total employment. The largest employment increases were registered in metals products in all countries, including the United States; chemicals and paper and printing showed more modest gains in employment.

On the whole, it appears that structural changes in employment in Western Europe during the 1950's and early 1960's, while differing in magnitude, tended to be similar to those occurring in the United States during the same period. In addition to shifts in employment between economic sectors and within different branches of manufacturing, workers have also had to adjust to changing manpower requirements among occupations, areas, and companies. Some adjustments have un-

TABLE 5. PERCENTAGE CHANGE IN CIVILIAN EMPLOYMENT BY ECONOMIC ACTIVITY, 1950–62

Activity	France[1]		Germany[2]		Netherlands[3]		United Kingdom		United States	
	Employment	Percent of total employment	Employment	Percent of total employment	Employment	Percent of total employment	Employment	Percent of total employment	Employment	Percent of total employment
All activities	+1.0	0	+26.1	0	+15.1	0	+9.3	0	+14.6	0
Agriculture, forestry, hunting, fishing	−25.7	−7.5	−31.0	−11.1	−20.3	−4.4	−21.3	−1.6	−28.2	−5.0
Mining and quarrying	−17.4	−.4	+44.0	+6.1	+7.7	−.1	−16.4	−.9	−29.2	−.6
Manufacturing	+7.7	+1.8			+15.3	0	+3.6	−2.1	+9.8	−1.1
Construction	+22.4	+1.5			+26.1	+.8	+15.6	+.4	+24.3	+.4
Electricity, gas, water, and sanitary services	+21.7	+.2			+5.9	−.1	+9.4	0	+12.3	0
Commerce	+19.6	+2.2	+45.7	+5.0	+25.3	+1.3	+31.1	+2.7	+26.1	+2.3
Transport, storage, and communications	+9.6	+.5			+16.1	+.1	−5.2	−1.0	−5.1	−1.0
Services	+11.1	+1.7			+27.0	+2.4	+21.4	+2.5	+38.9	+5.0

[1] 1954–62.
[2] Beginning 1960, new classification by activities.
[3] 1950–61.

SOURCE: *Manpower Statistics, 1950–62*, OECD, Paris, 1963, table III.

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[12] "Reply from Sweden to Questionnaire by OECD Council on the Implementation of the Recommendation on Active Manpower Policy: Intentions, Procedure, Recent Progress," Stockholm, June 22, 1955 (Xerox).

doubtedly involved a combination of shifts on the part of the same individuals; e.g., industry and occupation, firm and area, occupation and area, etc. Technological change affecting entire industries, firms within industries, and occupations have played an important but nonmeasurable role in all of these structural changes.

In none of the countries visited have individuals accepted the adverse consequences of change willingly and without protest. Indeed, neither the employers nor the governments involved expected employees to accept displacement, temporary unemployment, geographical relocation, change in occupation, or other hardships caused by forces beyond their control, without financial and other assistance. Trade unions, though varying in size and strength, are important in all five countries, and have played a key role in inducing workers to accept change or in spearheading resistance to change. Economic, historical, political, and cultural factors, as well as measures taken by governments and employers, either unilaterally or through collective bergaining, have determined the reactions of workers and their unions to technological change. These are discussed in the following chapters for each of the five countries studied.

Chapter 2. Great Britain

There is broad agreement among representatives of management, labor, and government that Britain needs badly to speed up modernization and rationalization of its industry in order to increase productivity and economic growth. The feeling appears to be unanimous that "we are not doing nearly as well as we should and must." There is less unanimity on the allocation of responsibility for Britain's lag in technological development: Some blame labor for resisting change, especially when it entails redundancy; others criticize management for being too conservative in initiating change as well as in refusing to "go to the mat" with labor on the issue of redundancy resulting from automation and technological advance. The result: Underemployment and overmanning in many industries, labor unrest, sometimes flaring up in strikes, over the issue of redundancy, and the significant lag noted earlier in economic growth and productivity as compared with almost any other industrialized country. In this chapter we shall examine some of the factors influencing technological development and what is being done by industry, unions, and Government to improve Britain's performance.

British Management

A trade union official says the British manager typically asks, "why innovate," while the American manager asks, "why not?"

A university industrial relations specialist describes British management as "the cult of the amateur." British managers are considered inadequately trained for their jobs as compared with their American and West European counterparts. They are said to be especially weak in the technical aspects of production and not able to appreciate the importance of modern technology, such as the use computers can be put to in business. Quantitative methods ("maths" and "numeracy") and the social sciences are frequently mentioned as neglected areas in the educational background of British management. A recent study of management in several West European countries confirms these estimates of the British business executive.[1]

British management does not emphasize higher education as much as some other countries, although the proportion of university graduates was found to be substantially higher among the younger than older managers. While science and technology men predominate among university graduates, they have a much poorer record of moving up to top management posts than do arts men from provincial universities, let alone arts men from Oxbridge. British companies play down the importance of theoretical training, and a first class science degree is valued less in managerial recruitment than a second class arts degree.

The widespread absence of university education in British management is not offset by professional qualifications. A relatively small proportion of middle- and top-level management in large British manufacturing companies was found to have professional qualifications, and out of a sample of 300 managing directors and general managers of firms with over 1 million capital, half listed themselves as without any formal qualifications whatsoever. Of the directors in charge of production in these firms, slightly more than half described themselves as being without either engineering or scientific qualifications. The proportion of British managers and white-collar employees engaged in production and technical services is much lower in Britain than on the continent. The British companies put a much higher proportion of their manpower into such functions as finance and accounting, personnel, sales and purchasing, and administration than do firms in France and West Germany.

On the positive side, British management offers more opportunities to capable young men rising from the ranks, and draws upon a much wider sweep of the population than do the other countries. There is still considerable room in British management for the boy who started work at an early age and worked his way up.

According to Professor Granick, "Britain stands alone in the relatively low prestige given to management, even to top management. The civil service, the independent professions, the universities, and the church: These are the fields for which men of elite background strive."[2]

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[1] D. Granick, "Management in European Heavy Industry," *Steel Review*, October 1962, pp. 23–29. For a more extensive discussion, see Granick's *The European Executive*, Weidenfeld & Nicolson, 1962.

Neither in Britain nor on the continent is there any widespread acceptance of the view that management is a profession and that a manager is to be judged by his professional competence. In Britain the nebulous concept of "character" still receives top place.

The British are trying to improve their training of management. In 1963 the National Economic Development Council said that "there is a need in this country for at least one very high level graduate school or institute somewhat on the lines of the Harvard Business School or the School of Industrial Management at the Massachusetts Institute of Technology."[3] In 1965 two new business schools were started, one in London and another in Manchester. The Manchester school opened its first class with 15 students, but expected by 1972 to have 400 students and a teaching and research staff of 50.[4] As a result of the Robbins Report issued in 1963, a great expansion in the number of universities and students is underway.[5] It is reasonable to expect that British management will gets its share of the new university graduates.

Worker and Trade Union Attitudes Towards Technological Change

In no other country have top trade union leaders endorsed the need for increased productivity and even embraced "automation" more than in the United Kingdom. The Trade Union Congress, in 1963, endorsed the National Productivity Year in the following terms:

> For trade unionists, the National Productivity Year serves to underline the view that all the country's resources must be effectively used if trade union objectives are to be secured. . . . Unions are in favor of greater productivity. The security of employment, higher earnings, and better conditions that we want for workers are more likely to be obtainable in the efficient undertakings than in the inefficient.[6]

In 1956 the TUC statement on trade unions and automation expressed the view that trade unionists had more to fear from "too little automation than from too much." It said that there was reason to expect that a variety of economic, technical, and other facts would impose restrictions on the speed and extent of applications in industry. Reviewing the situation in 1965, the TUC found that—

> In general, the General Council's assessment made in 1956 has proved correct: The introduction has been gradual, and the problems and benefits for trade union members—although important in some cases—have not been of great general significance. . . . In the main affiliated organizations have had no difficulty in dealing with developments . . . in their own industries.[7]

It noted that the rate of change was increasing but went on to say that "perhaps a more significant feature has been the length of time that is being taken by British industry to take advantage of the possibilities offered by scientific and industrial research." The emphasis in the statement, as one might expect in a paper prepared for a TUC Conference, is on safeguards to protect workers against the adverse effects of technological change. But nothing in it suggests a reversal of the 1956 conclusion or any great concern over the employment effects of automation and technological change.

Perhaps most significant and indicative of the attitude of some top trade union leaders (though by no means all) towards automation is their participation in the Foundation on Automation and Employment. The Foundation was established a few years ago as a sister organization to the American foundation of the same name. But its views on automation are quite different: Where the American group generally "views with alarm" and warns about the dire effects of automation on employment, its British counterpart encourages the acceptance and spread of automation. The title of its last conference, held in May 1965, was "Removing Obstacles to Automation," and one of its main purposes was to improve the "image" of automation. The chairman of the Foundation is Sir William Carron, president of the Amalgamated Engineering Union (AEU), who has become known among his members as "Mr. Automation" because of his enthusiastic espousal of technological change. Other members on the Foundation's top board, called the Council of Management, are Jack Cooper, general secretary of the National Union of General and Municipal Workers (NUGMW); Sir Harry Douglass, general secretary of the Iron and Steel Trades Confederation; and Sidney Ford, president of the National Union of Mineworkers. Their counterparts on the council from management are equally prominent: Lord Robens, chairman of the National Coal Board; Sir Leon Bagrit, industrialist and a member of the Ministry of Technology Advisory Council; C. R. Wheeler, chairman of the Associated Electrical Industries; and Douglas Taylor, deputy director of the Confederation of British Industry.

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[2] Granick in *Steel Review, op. cit.*, p. 27.

[3] *Conditions Favourable to Faster Growth,* National Economic Development Council, HMSO 1963, London, p. 5.

[4] *The Times*, London, July 20, 1965.

[5] *Higher Education,* Report of the committee appointed by the Prime Minister under the chairmanship of Lord Robbins, 1961–63, HMSO, October 1963.

[6] *Labour*, May–June 1963.

[7] "TUC Policy on Technological Change," March 1965, p. 1 (mimeo).

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But the views of union leaders do not necessarily reflect the thinking or guide the actions of their membership. Carron's union, the AEU, has for many years had a policy of "no redundancies" despite the opposition of its president. In 1957 it adopted a resolution instructing the Executive Council "to conduct a national campaign against redundancy and unemployment and for the 'Right to Work'" (used in its literal meaning rather than in the U.S. sense), and "where redundancy is threatened . . . to warn the employers that this union will move into action to safeguard the livelihood of our members and will demand the 'Right to Work' and that the necessary action will be taken to enforce our demands."[8] This resolution was reaffirmed in 1958 and 1959. In 1964 the National Committee called for a study of automation, but pending its completion declared its policy to be: "No redundancy arising from introduction of automation; labor so displaced to be retained on payroll pending alternative work without loss of earnings." The rest of the resolution called for:

> 1. No introduction of automation without previous consultation.
> 2. The increased productivity resulting from these processes to be reflected in increased earnings and reduced hours without loss of pay.
> 3. Technical training in automation for all engineers.
> 4. We call on district committees and shop stewards to insist on discussions with separate employers to ascertain plans and extent of proposed introduction of automative methods into the various establishments.
> 5. Finally, we instruct Executive Council to seek discussions directly with the Engineering Employees' Federation, and other national undertakings; and to call for the establishment of a tripartite committee to control the introduction and scope of automation—such a committee to consist of representatives of the trade unions, the employers and the Government.[9]

President Carron in his speech to the conference, while affirming support for automation and technological advance, warned that "we have always insisted—and shall continue to insist—I hope—upon a fair and equitable distribution of the profits accruing to technological progress and to advanced forms of productivity."[10]

The NUGMW presented a report to its 1965 Congress, which concluded that—

> a more rapid rate of technological change within the next few years is unavoidable. Because its potential benefits outweigh any disadvantages, we should welcome technological progress. . . . Some hardship and anxiety among workers will be unavoidable. The State and industry should adequately compensate workers for any hardship suffered.[11]

Workers on the shop floor and their shop stewards, who in Great Britain often have no ties to the official union hierarchy, do not view automation and changing technology with the same degree of equanimity as some union leaders. To them, it makes little difference that there is full employment and that alternative job opportunities are usually available to workers made redundant by technological change. They want continued tenure in the jobs they hold and have held for many years. This attitude is found increasingly in industrialized and industrializing nations where workers consider that they "own their jobs."[12] One has only to read the British press for a week or two to become aware of the importance of redundancy in the eyes of the workers and, we assume, the general public. Hardly a day goes by without at least one news story of an actual or threatened redundancy. Even the layoff of 20 or 30 workers in a relatively large firm will merit a detailed account not only in the provincial press, but in such national newspapers as the London *Times* and the Manchester *Guardian*.

The redundancy issue appears to loom larger when only part of the work force is affected—as in the case of a change in equipment, technology, or plant reorganization—than when an entire plant is closed down. The logic is that there is very little workers or a union can do when threatened by a plant closure: A strike will probably only hasten the event; harassment of management can hardly be very effective when company officials have only a short time to remain in the community and may indeed be out of jobs themselves soon; and there is an assumption that closures are dictated by economic facts which cannot easily be controverted. Partial redundancy, especially when caused by new equipment or technology which will increase productivity and probably profits, is another matter: Management can always afford to carry a few additional workers under such circumstances; there is also the issue of the order of layoffs which is an ad hoc decision in most British firms, unlike the situation in the United States where detailed contract provisions deal with this subject and, even in nonunion plants, seniority is usually the most important criterion. This has led to the view that in Great Britain it may be easier to build new modern plants, encompassing large-scale technological changes, and shut down existing facilities than to introduce smaller changes in older plants and run the risk of disruption and strikes by disaffected workers and unions.

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[8] F. Meyers, *Ownership of Jobs: A Comparative Study*, Institute of Industrial Relations, University of California, Los Angeles, p. 33.

[9] *Report of Proceedings of the 46th National Committee, Amalgamated Engineering Union*, Apr. 27 to May 8, 1964, p. 59.

[10] *Ibid.*, p. 241.

[11] "Technological Change," National Union of General and Municipal Workers, Special Report, Annual Cong., May 24–27, 1965, p. 25.

[12] *Ownership of Jobs, op. cit.*

Redundancy Policies

Private Industry

Many employers have accepted overmanning in varying degrees and have postponed or been deterred from introducing new equipment or improved processes because they felt they could not afford, or were unwilling to incur industrial strife. Others, however, have tried to meet resistance to change by dealing with the problem in a more constructive manner. This has taken the form of better planning of change and the adoption of redundancy policies which have included: Consultation with employees and/or unions; measures to keep redundancy to a minimum; establishing procedures for selection of employees to be dismissed; assistance to redundant workers in finding other jobs; advance warning, severance pay, early retirement, and other provisions designed to make change more acceptable to workers. These policies have been instituted in some cases unilaterally by employers and in others after consultation with unions. They have rarely, however, been embodied in formal signed agreements.

The British Ministry of Labour conducted a survey of employer redundancy policies in February 1963.[13] It found 371 policies in companies employing 1,750,000, an increase of 60 percent in both the number of policies and employees covered since the previous survey in 1959. All but six of the companies were in manufacturing and their total labor force constituted 16.5 percent of all manufacturing employment. The largest number of policies and proportion of employees covered was found in engineering and electrical goods, vehicle manufacturing, and chemicals. The largest increase in number of policies instituted since 1959 was in the textiles, food, drink, and tobacco industries. Redundancy policies were more common in large companies: 62.5 percent of the companies with policies had 1,000 or more employees; only 17 percent employed less than 500. About 45 percent of the policies had been adopted after consultation with employees' representatives, but only 18 were actually embodied in formal signed agreements. All the other policies were adopted by management acting on its own. This pattern had not changed since the previous survey indicating a continued reluctance on the part of unions and managements to be bound by written agreements on this sensitive issue. Redundancy was usually broadly defined, and 95 percent of the policies covered all cases involving involuntary loss of a job through no fault of the worker concerned. Only a few policies were restricted to redundancies arising from introduction of new machinery, closure of a department, or other specified management decisions.

The following types of provisions were included:

1. Most policies provided for consultation with employees' representatives in the event of redundancy.

2. Most policies referred to transfer of employees within the undertaking and to restriction of recruitment as methods of reducing the number of dismissals. It was generally accepted that only essential overtime should be worked and over half the policies referred to the possibility of reducing weekly hours before laying off workers.

3. Some companies paid a temporary supplement when, as a result of transfer, an employee's wage was reduced. A few made such payments only while the employee was being retrained for a new job. Some companies also gave financial assistance to employees transferred to another locality to help pay removal or daily traveling expenses.

4. In selection of employees to be dismissed, about 40 percent specified a combination of efficiency and length of service. Another 40 percent stated that certain categories of employees were to be dismissed first: Most commonly mentioned were employees over the normal retirement age; next came part-time workers and married women; most of these policies used a combination of seniority and efficiency as their secondary criterion for dismissal. Of the remaining 20 percent, the majority used seniority as the sole guide, and a few specified efficiency alone.

5. Two-thirds of the policies provided an opportunity for employees to appeal against selection for dismissal.

6. Most policies gave employees limited time off with pay to look for work. A majority of the policies also provided for the local Employment Exchange to be given advance warning, and Ministry of Labour officials were often permitted to register employees on the factory premises. Some employers undertook to canvass other employers in their area to locate vacancies.

7. About two-thirds of the firms offered priority of reengagement to former employees who had been made redundant.

8. In industry generally, an employee was entitled by law to 1 week's notice before dismissal if he had more than 26 weeks but less than 2 years' continuous employment, 2 weeks' notice for 2 to 5 years of service, and 4 weeks' notice for service of more than 5 years. An employee wishing to terminate employment had to give his employer 1 week's notice if he had been continuously in his employ for 26 weeks or longer.[14] Over 70 percent

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[13] "Redundancy in Great Britain," *Ministry of Labour Gazette*, February 1963.

[14] "Contracts of Employment Act 1963," HMSO, London.

of the policies provided for employees to be given extra notice, with the possibility of payment in lieu, or advance warning, or both. The additional notice generally ran to a maximum of 10 weeks, depending on length of service.

9. Fifty-two percent of the policies covering 74 percent of the employees provided for severance pay, the amount being usually related to length of service and given as a lump sum. (In actual practice severance pay was almost always paid in the event of closure of a plant or part of a concern.) The lump-sum payments varied greatly in size. Only 28 companies gave as much as a week's pay for each year of service. Large firms tended to be more generous than small ones. The average service qualification was 2 to 3 years.

10. Relatively few policies mentioned pension rights. The usual practice was for firms to refund the employee's contributions when he was dismissed. Older employees were sometimes allowed to remain in a pension scheme and receive a reduced pension at retirement age.

Most redundancy policies in private industry were developed by individual companies. Where industrywide arrangements did exist they generally applied to manual workers only and set forth general principles to be followed in handling redundancy, with detailed application being left to individual firms or units. About 1¼ million employees were covered by industry schemes in 1963, including about 360,000 who were counted above in the coverage of individual firms.

Nationalized Industry [15]

The nationalized industries have negotiated with their unions redundancy policies that are much more generous than those usually found in private industry. The coal, gas, electricity, transport, and atomic energy industries, with a total of 1,700,000 workers, have industrywide agreements on redundancy. Most of them cover manual workers only, but it is unlikely that staff employees would receive less favorable treatment. Major provisions in 1963 included:

1. Consultation with trade unions about impending redundancy. In the electricity industry, at least 12 months' warning was given of intention to close down a power station.

2. Attempt to avoid dismissal by transfer. Assistance to cover expenses of added travel, household removal, and temporary lodgings resulting from transfer to a different workplace.

3. Several agreements guaranteed, for a specified period, former earnings in whole or in part for employees transferred temporarily to lower grades. On the railways pay was fully made up for 5 years with the possibility of a further extension. Other industries provide makeup pay for lesser periods.

4. Length of service was generally the determining factor in dismissals.

5. Many agreements provided for severance pay related to length of service. Each industry has an agreement worked out with its union providing for weekly redundancy compensation, and/or lump-sum payments. Weekly payments were usually about two-thirds of the standard rate of pay less unemployment benefit, as for a single man, for a period varying with length of service. The maximum duration was 26 weeks under the National Coal Board agreement and 40 weeks for railway workshop staff. Lump-sum payments were often based on the formula of two-thirds of the standard weekly time work rate less unemployment benefit, as for a single man, and related to length of service.

6. A redundant mineworker aged 60 or more with at least 10 years' service received an immediate pension (as well as a lump-sum payment). If a man was below 55 he received a lump sum based on his contribution record; if between 55 and 60, he had the option of receiving this lump sum or a deferred pension. There were also special pension arrangements for railway workshop staff who become redundant.

Redundancy Experience, 1961–62 [16]

Firms are encouraged to report impending large-scale redundancies to their local Employment Exchange, and they generally do so. During the 1-year period October 1961–September 1962, there were 1,355 cases of redundancies involving 102,000 workers reported by private industry. On the average each redundancy involved 75 employees. About one-third of the workers were dealt with in accordance with established policies; another one-third were dealt with under ad hoc redundancy procedures; the remaining third were discharged under normal dismissal procedures. In 57 percent of the cases employees received severance payments, or more than the normal notice, or both.

The fact that fully two-thirds of these employees were in companies without established policies highlights an important difference from U.S. practice, where practically all collective bargaining agreements provide in some detail for layoff and dismissal procedures. Many industrial relations experts consider the absence of such procedures in most British firms to be an important cause of unofficial strikes over redundancies.

There was considerable variation in the length of unemployment following these collective redundancies. In regions where the unemployment rate was low, few workers remained unemployed for long. In one case in the London area, where the overall unemployment rate was only 1.1 percent, 94 percent of 250 redundant workers found employment within 6 weeks. Absorption was a little more difficult in the Midlands, South Western, and North Western regions. In a very large redundancy in the Midlands, there were 1,583 dismissals beginning in April 1962, and an additional 1,400 left voluntarily. By the end of August, 4.2 percent, mainly unskilled or female clerical workers, remained unemployed. Experiences varied in the Northern region, Scotland, and Wales, though even here absorption proved less difficult than might be inferred from the relatively high general unemployment figures in these regions, 2.5–4.0 percent. The position in the particular locality was an important factor. In one case, in an area of rising unemployment in Wales, a steelworks closed at the end of July 1962, after 2 months' advance warning, making 575 men redundant. At the beginning of December, 112 were still registered as unemployed. A chemical firm in another area, also in Wales, announced that it would reduce its labor force by 150 between August and December 1962, as a first phase before closure in mid-1963. Some dismissals were avoided by transfer to another works, and some workers left to take other jobs before dismissal. Of a total 65 men dismissed in the first phase, only 6 remained on the Employment Exchange register by mid-October 1962 (there may have been others unemployed who did not register).

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[15] "Redundancy in Great Britain," *op. cit.*

[16] *Ibid.*

According to the Labour Ministry the main points to emerge from this 1-year study were:

1. The general demand for labor in the area is important, as are the size and structure of local industry and the travel-to-work pattern.
2. Skilled workers tend to find jobs easily, unless their skills are of a specialized kind not in general demand.
3. Older workers have the most difficulty finding employment. Younger unskilled workers are not normally unemployed long.
4. Women, and especially married women who are not able to travel far to work, have more difficulty finding new jobs.
5. Some redundant workers have to accept less skilled jobs at lower pay.
6. Workers of good quality are rapidly engaged by employers who may, in turn, discharge their less efficient employees.
7. The effect of major redundancies is greatly eased by ample warning in advance and the phasing of dismissals.

Two Examples of Successful Handling of Redundancy

An outstanding example of a successful plant closure was at the Milton plant of the British Aluminium Co., when production was transferred from this old works in the Midlands to the company's more modern operations in South Wales. The economic aspects were carefully worked out, the union was notified 6 months before the redundancy began, and, 15 months before the final closure, dismissals were arranged in several stages. The order of layoffs was worked out by a union-management committee. It included an appeals procedure, generous terms for early retirement, severance pay, and transfer to the new operations for some employees. Even so only nine hourly paid men agreed to transfer—less than 1 percent of the 840 eligible, and far less than the 60 the company had wished would move. Despite the full employment in the Midlands area and the careful planning of the closure, there were casualties. Sixteen months after the first redundancies began and 6 months after they ended, there were still 63 persons, or 6 percent of the Milton labor force, registered as unemployed, including 26 who had been on the register for over 6 months, another 26 from 3 to 6 months, and the rest under 3 months. Fifty of these were aged 50 or over, 27 were 60 or over.[17]

Another example of successful manpower planning under extremely difficult circumstances is the way the National Coal Board has handled the closing of uneconomic mines in Great Britain. During the period 1957–64, employment was reduced by 215,000, or 31 percent. There were an average of 38 closures per year during this 7-year period, as compared with only 20 during the preceding 10 years. The proportion of output cut and loaded by machine rose from 15 to 70 percent, and productivity rose by 40 percent. Wage costs in the industry have been stable since 1956, and earnings have increased by 32 percent. Of the 115,000 men involved in the closures, the vast majority were transferred to other jobs with no break in employment. Most of the remainder—about 19,000 men—were placed in jobs before their redundancy pay ceased after 6 months. The number of employable men still out of work 6 months after layoff was very small. The men received redundancy compensation pay equal to two-thirds of their standard grade rate when they became redundant. In addition, lump sums were paid to men aged 51 and over, and immediate pensions were given to men of 60 and over with at least 10 years of service.

The Coal Board admits that additional costs were incurred in order to plan a gradual rundown "because of its social obligations as an employer and the necessity to avoid friction which might affect the introduction of mechanization." Closing the pits too soon would have resulted in large-scale redundancies which would have had serious social and economic repercussions. The labor force has been reduced more slowly than demand and productivity warranted and this has resulted in some stocking of coal.[18]

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[17] A. Fox, *The Milton Plan: An Exercise in Manpower Planning and the Transfer of Production,* Institute of Personnel Management, 1965.

Collective Bargaining

In contrast to the United States, job security issues have not had a dominant influence on collective bargaining in Great Britain in recent years. As noted earlier very few agreements include provisions regarding the handling of redundancy, and even firms with redundancy policies rarely incorporate them into their formal agreements. This situation may change as technological advance is accelerated. The TUC report to the 1965 Conference advised trade union representatives to seek the following safeguards for workers:[19]

1. A detailed schedule and timetable drawn up well in advance of the actual introduction of technological change as a basis for a realistic appraisal of the implications for workers;
2. Measures to adapt workers to the technical needs of the change, with emphasis on absorbing any impact on employment through natural wastage and through financial aids for retirement and facilities for finding new jobs; the aim should be to minimize threats to workers' security and status;
3. Agreement on procedures for selecting employees for retention or discharge;
4. Adequate facilities for retraining;
5. Assurance that levels of earnings will be safeguarded and financial incentives provided for workers adequate to elicit their support for the changes;
6. Consideration of the effect of proposed technological change on working arrangements and conditions of work;
7. Close consultation with union representatives at all stages.

This is considered a "minimum" program. Other parts of the report called for 12 months' notice of impending redundancies, severance pay over and above amounts expected to be required by legislation, the 35-hour week, more and better training, and increased government research on which to base manpower projections for the future. Most of these objectives fall within the purview of government, and the TUC was undoubtedly spelling out what it expects of the Labour Government as well as what it would like to achieve through collective bargaining.

Union demands in collective bargaining tend to stress the traditional areas of wages and hours with some emphasis also on additional vacations with pay. The rapid increase in wages and prices led to the creation of the National Board for Prices and Incomes in April 1965. The Labour Government is presently engaged in developing an "incomes policy" which will provide for an "early warning system" for wage increases, and, the government hopes, result in a scaling down of union wage demands. However during the summer of 1965 increased wages were still regarded by both employers and unions as the primary issue in coming negotiations.

The shorter workweek also has a high priority. The normal workweek is now about 42 hours in most industries, and 35 hours has been set as a target by the TUC. During the past year there has been some movement towards a 40-hour week and this is continuing in current negotiations.

Some 75 percent of all wage earners are entitled to basic holidays (i.e., vacations) of 2 weeks per year, with the remaining 25 percent receiving more than 2 weeks.[20] Except in a small number of industries the basic entitlement, generally starting after 1 year of service, has remained unchanged since it was increased from 1 to 2 weeks in the early 1950's. This is considerably less than on the continent, where a month's holiday with pay is fairly common. British unions are pressing for an increase in both the basic holiday entitlement and improvement in length of service requirements.

On the employers' side there is strong sentiment for eliminating unnecessary overtime work, reducing overmanning, abolishing rigid demarcations between crafts, and increasing productivity. The government supports these objectives. There have been several agreements embodying the "productivity bargaining" approach which is being talked of a great deal in employer and academic circles.

The best known is the one reached by the Esso Refinery at Fawley (near Southampton) with its unions, which has been analyzed in a book by Allan Flanders of Oxford University.[21]

In 1960, the company, a wholly owned affiliate of Standard Oil of New Jersey, succeeded in negotiating changes in a range of institutionalized working practices responsible for underemployment of labor. These included drastically reducing overtime, redeploying craftsmen's mates on other work, and relaxing job demarcations. In return for these concessions the union won unusually large wage increases spread over 2 years.

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[18] "Programing for Technological Changes and Manpower Adjustments, OECD Project 20-13, the Coal Industry in Great Britain" (undated, mimeo).

[19] "TUC Policy on Technological Change," *op. cit.*, p. 31.

[20] *Statistics on Incomes, Prices, Employment and Production*, No. 13, June 1965, Ministry of Labour, HMSO, London.

[21] A. Flanders, *The Fawley Productivity Agreements*, Faber and Faber, 1964.

A second but less impressive round of "productivity bargaining" was completed with greater difficulty in 1962–63. Redundancy was avoided after the first agreement. However, more recently there have been dismissals with severance pay at Fawley which some union officials say has left a "sour taste" in the mouths of the workers. Though the redundancies were labeled "voluntary" for workers willing to accept the offered severance pay, there is some feeling that had they refused to accept dismissal voluntarily they would have been laid off in any event.

Other agreements, broadly characterized as falling within the new "productivity bargaining" approach, include those in the boot and shoe industry, papermaking, and at the Shell-Mex Co. A few companies are currently engaged in negotiations which may result in some significant settlements, including the extension of salary status to all employees. The "productivity bargaining" approach resembles some of the agreements negotiated in the United States in recent years, in which companies have "bought out" restrictive practices in return for generous wage increases and various guarantees of job security.

There is some concern about these so-called "productivity" bargains among employers who bargain on an industry basis. They point out that they are invariably reached in plant-level negotiations rather than the more common industrywide settlements. This must necessarily be so because the restrictive practices they are designed to eliminate are peculiar to individual plants rather than to an entire industry. Employers fear that unions will try to extend to other companies the generous wage and other benefits that they have achieved in these plant bargains, but without granting the same concessions. Oil companies and U.S.-owned automobile companies are being eyed with particular suspicion because they bargain on a company basis rather than through industrywide associations.

There is a definite trend towards plant bargaining in Great Britain which is also of concern to trade unions because it shifts the locus of power to the shop stewards and away from the national and branch union officials. Plant level bargaining could create difficulties for any "incomes policy" which must of necessity be negotiated at the very top levels of industry, labor, and government. This was one of the factors leading to the 1965 merger of the three major employer confederations: The Federation of British Industries, which was concerned primarily with financial matters; the Employers' Federation, composed of employer associations for collective bargaining purposes; and the British Manufacturers' Association, made up mostly of smaller companies. It is hoped that the Confederation of British Industry, the merged organization, will better represent the interests of employers on matters pertaining to regulation of wages, prices, and profits which are increasingly becoming the focal point of government policy. The question is whether an "incomes policy," accepted by the TUC and the new employers' organization, can be effectively applied to numerous plant and individual company bargains. It is the kind of dilemma that would confront American labor and industry should we decide to adopt an incomes policy without the paraphernalia of controls similar to those set up in wartime. While this is, at present, an academic question for the United States, British employers and unions are currently faced with the prospect of making such a policy operate effectively.

Government Programs

As this is written, the Labour Government has just announced its long-awaited National Plan for the next 5 years. According to reports, it calls for a 25-percent increase in GNP by 1970—an average annual rate of 3.8 percent. Output per worker will have to increase by 3.4 percent per year (as compared with 2.7 percent in 1960–64), and the labor force is expected to grow by 0.4 percent per year.[22] Manpower projections for 1965–70 show a sizable shift of workers from agriculture and coal mining to manufacturing and services and call for better utilization of manpower in the depressed areas in the north of England, Scotland, and Northern Ireland. Overall there is expected to be a manpower shortage of 200,000, while skilled workers will continue to be in short supply even in the relatively high unemployment areas.

To attain the Plan's objectives, the Government will rely on a number of measures—some already on the books—dealing with research and development, incomes policy, industrial training, redundancy payments, and regional and industrial development and growth.

Research and Development

The Government is trying to encourage automation and technical progress largely through the efforts of the new Ministry of Technology which is headed by Frank Cousins, general secretary (on indefinite leave) of Britain's largest union—the General and Transport Workers' Union. In the research and development field, the Ministry operates from three main bases: Research stations; the

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[22] *Business Week*, Sept. 25, 1965; and *New Statesman*, Sept. 17, 1965.

National Research and Development Corporation; and the Atomic Energy Authority.

The 11 research stations employ about 5,000 staff, including 1,400 graduate scientists and engineers. They are supposed to maintain a close relationship with industry and are able to use government contracts to encourage the establishment of research teams and facilities in industries where they are most needed. The research station budget in 1965–66 is over 9 million pounds ($25.2 million).

The National Research and Development Corporation is concerned with bringing inventions to the stage where they can be taken over for industrial production. It has already sponsored 120 projects and expects to invest a great deal in development of a British computer industry. Its resources have been increased from 10 million pounds ($28 million) to 25 million pounds ($70 million).

The Atomic Energy Authority will also undertake research and development outside the atomic energy field; e.g., desalinization. Its extensive experience in materials research, automatic handling, and scientific instruments will be brought to bear on the problem of increasing automation in Great Britain. The Authority has 30,000 employees, including 5,000 graduate scientists and engineers, and a research and development budget of 50 million pounds ($140 million).

The Ministry feels that in many fields Britain has led the world in pure research but that other countries have done better at industrial application of research, with the result that Britain has sometimes finished up importing its own ideas (computers) or paying a royalty for their manufacture (drugs and silicones). The Ministry intends to further the practical application of new ideas by letting out development contracts, financing pilot projects, and establishing experienced teams of scientists and technologists to aid in the introduction of particular techniques in a firm or industry. It may also use government procurement contracts to encourage those companies that are considered technologically advanced. Top priority will be given to development of a flourishing British computer industry independent of foreign manufacturers. At the present time the United Kingdom has about 1,000 computers as compared with an estimated 20,000 in the United States. The Ministry believes that the ratio should be closer to 1 to 4 or 1 to 5, on the basis of population or wealth.

Incomes Policy

The agency with responsibility for keeping wage increases in line with productivity and maintaining price stability is the National Board for Prices and Incomes. We shall not concern ourselves in this report with the fundamental economic problems involved in carrying out this responsibility which are somewhat peripheral to the subject of manpower and technological change. However, the Board has made it plain that it will not confine itself to considering whether or not wage and price increases submitted to it are justified, but will also examine the underlying reasons for such increases. Most important in this regard is the attention given by the Board to restrictive practices on the part of either workers or employers, and their effect on productivity. The Board's approach is illustrated by its first decision on "road haulage" rates.[23]

The Board prefaced its discussion on productivity by asking: "How can productivity be increased so that this latest increase, and, still more important, future increases in wages, can be absorbed?" "The answer," it said, "is to be found in a drastic rethinking of the present working arrangements."

It then suggested that new "machinery" is needed for wage negotiation whose main objective "should be the removal of obstacles to increased productivity." Specifically it points to unnecessary overtime averaging 15 hours and going as high as 28 hours per week. Drivers try to secure schedules to drive 11 hours per day, the statutory limit, even though "no one pretends that the driver is at the wheel for 11 hours per day; the actual traveling time is a good deal less, and everyone is agreed that there is a considerable disparity between real working time and the apparent working week." The Board proposed that individual companies negotiate agreements which would finance increased wages out of higher productivity; in other words, substitute "productivity bargaining" at the company level for the existing system whereby minimum wage rates are set by a wages council for the entire industry. (Allan Flanders, author of the *Fawley Productivity Agreements* and a strong proponent of the "productivity bargaining approach," is consultant to the Board.)

The "road haulage" report further noted that there were factors outside the industry which affected productivity; e.g.,

> the uneconomic deployment of manpower in the [London] docks must have an adverse effect on the ability of the road haulage industry to improve its efficiency and stabilize its charges; [and] the wide and growing discrepancy between the number of hours per week the haulage industry is willing to work and the number of hours its customers will make available for loading and unloading.

The Board hit even harder on the recurring theme of increasing productivity and eliminating inefficient and restrictive practices, in its second report dealing with the printing industry.[24] In response to its own question: "How has it come about that in this industry output per man has risen only slowly, earnings have risen rapidly, profits have fallen, and prices have risen," it answered that the structure of the industry, the quality of management, and the attitudes of the unions must all share the blame. It documented this charge as follows:

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[23] "Road Haulage Rates," Report No. 1 (Interim), National Board for Prices and Incomes, HMSO, June 1965.

[24] *The Guardian*, Manchester, Aug. 18, 1965.

1. Opportunities for technical change and productivity improvements are being lost by failures to use modern management techniques.

2. Unions have restricted the intake of young trainees and apprentices, and companies have been guilty of inefficient use of manpower.

3. Demarcation arrangements, particularly between craft and noncraft unions, are among the more serious restrictive practices (e.g., a union's insistence that a craftsman should carry messages and sweep floors; papers being transferred from one department to another and changing hands at a line drawn on the floor; a noncraft union's traditional right to push buttons on a craft-controlled machine).

4. In case of a dispute, a machine may be installed for years without being used.

5. "Employers frequently express themselves forcibly about the restrictions imposed and yet, in practice, seem to display a fatalistic acceptance of them as part of the very character of the printing industry. . . . The employer must carry his share of the responsibility for failing to remove the sense of insecurity which accounts in large measure for the workers' attitude."

As a partial solution to some of the problems, the Board recommended that the printing unions should continue as rapidly as possible the process of merging, with a view to forming one union for the whole industry. This is regarded as the final objective. It postponed a final conclusion in the printing industry case until mid-1966, when, it proposed, the industry's Joint Manpower Committee should report on progress made along the lines suggested in the Board's report for improving efficiency.

Still a third report showed the importance attached by the Board for Prices and Incomes to its role of ferreting out and exposing obstacles to efficient operation and increased productivity.[25] This report called for a 6-month halt on price increases by flour milling and bakery companies pending formulation by the industries of proposals for "the more effective deployment of manpower." It recommended negotiations to reduce overtime work, a more scientific approach to distribution, and further mechanization and concentration and more efficient use of existing equipment.

The Board's decisions, and especially its comments on restrictive and inefficient practices and poor management, have received tremendous publicity. The objective is obviously to expose these practices by both industry and labor to the public eye and thereby put pressure on the parties to take remedial action. If successful, the Board may have an important influence on technological development and productivity in British industry.

No one can say how effective the Board's approach will be. At best, it can put the limelight on only a limited number of industries. In the meantime, rather than accept a compulsory "early warning" system for notifying the government about prospective wage and price increases, the TUC has worked out a compromise solution with George Brown, Minister of Economic Affairs. The TUC has agreed to police the system itself (1) by requiring member unions to notify the TUC about pending wage claims "where the General Council considers it necessary," and (2) by requiring them to discuss the claims privately with the TUC before submitting them to employers. Claims would either be approved, returned for further consideration, or passed on to Mr. Brown, who could, if he chose, refer them to the Prices and Incomes Board.[26] A recent report said that the TUC had asked unions to hold up further negotiations on 4 out of 55 wage claims put before it.[27]

There is considerable doubt whether the TUC can really perform the function which it has undertaken at the urging of its general secretary, George Woodcock. Despite the pressures, political and economic, operating in favor of support for the Labour Government, the vote at the TUC Conference was only 5.3 million for the proposal and 3.3 million against. The TUC, according to the *Economist*, has only postponed the day of reckoning "when the real row must begin between the trade unions and the Government."[28]

The government has also persuaded British industry to go along with a "voluntary" approach to wage-price regulation. The Confederation of British Industry has agreed "reluctantly" to give the government advance information on contemplated price increases for major products. Industry and government representatives will prepare a list of products to be covered by the "early warning" requirement for prices.[29]

Regional and Industrial Development

Like the United States and most other countries, the rate of unemployment in Great Britain varies among different geographical regions. The net effect is an imbalance of underused resources, including manpower, in some areas and congestion in others. One of the main reasons for the regional pattern of unemployment is that certain industries and services in which large changes have been taking place tend to be grouped in specific regions. Most of the early industrial centers had to be established close to coal, iron ore, and adequate water supplies. With the decline in employment in the industries in these centers and the rise of new industrial centers, some regions—in the North, Scotland, and Wales—have experienced relatively high unemployment and outmigration, while others have had overfull employment and large population increases. The largest employment decreases outside of agriculture have occured in mining, textiles, and shipbuilding, which have been concentrated in the old industrial centers. On the other hand, new and expanding industries, such as engineering and electrical products, metal products, and machinery, have tended to concentrate in Greater London and the South East generally, and in the Midlands.

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[25] *The Guardian*, Manchester, Sept. 2, 1965.

[26] *The Observer*, London, Sept. 5, 1965.

[27] *The New York Times*, Oct. 21, 1965.

[28] *Economist*, Sept. 11–17, 1965.

[29] *The New York Times*, Oct. 21, 1965.

In some regions unemployment has for decades been consistently above the national average. In mid-December 1964, the national average rate of unemployment in Great Britain was 1.5 percent. While the rates for London, the whole of the South East, and the Midlands were 1 percent or less, the percentages for the Northern region, Scotland, and Wales were 3.0, 3.4, and 2.7, respectively.[30] Also, in the last three regions and elsewhere in Northern and South Western England, there are areas where unemployment is much higher. The overall effect has been a drag on the rate of economic growth, pressures on incomes and prices caused by "overheating" in some areas, and underutilization of manpower in others, outmigration and damage to community life in some areas, and congestion, housing shortages, and overcrowding in others.

These problems are not new, and the situation has improved considerably as a result of a series of measures instituted over the past 20 years. The various activities which have been centered in the Board of Trade were, in general, designed to direct industries to areas with unused resources and to keep them out of areas where there is already too large a concentration of industry. These measures have been described and evaluated in the hearings of the Senate Subcommittee on Employment and Manpower and need not be recounted here.[31] The Labour Government has now reorganized the regional development machinery and introduced a greater element of coordination and planning.

The new Department of Economic Affairs (DEA) has been charged with overall responsibility for regional planning as well as for development of the long-term national economic plan. Two new kinds of planning bodies have been set up in each region: A Regional Economic Planning Board and a Regional Economic Planning Council. The Board prepares the regional plan and coordinates the regional work of the various government departments concerned with its implementation. It is made up of full-time civil servants representing the main government departments in the region. The Council is supposed to reflect regional views, ideas, and experience. It consists of part-time members drawn from local government, industry, and commerce, trade unions, universities, and other community groups. Its principal functions are to assist in formulation of the regional plan and to serve in an advisory capacity to the Regional Board.[32]

Through the new machinery, comprehensive plans are being developed for each region taking into account manpower requirements, labor supply, population growth, transport, housing, etc. Each Regional Planning Board collaborates with the DEA in the preparation of its draft plan. It is the task of the DEA to fit the regional plans into the framework of the national economic plan and to secure the best order of priorities. It remains to be seen in what ways the regional boards and councils will change and improve upon the regional development activities conducted under the Conservative Government and centered in the Board of Trade.

The counterpart of the regional activities carried on in the DEA is the planning along industrial lines in the same department. This is closely linked to the work of the Economic Development Committees—"little neddies"—established to examine the performance and prospects of individual industries, assess their progress and make forecasts, and consider ways to make them more efficient. The "little neddies" derive their name from the National Economic Development Council (NEDC), first established in 1962 and newly constituted by the Labour Government under the chairmanship of George Brown. The functions of the NEDC are:

> 1. To examine the economic performance of the nation with particular concern for plans for the future in both the private and public sectors of industry;
> 2. To consider what are the obstacles to quicker growth, what can be done to improve efficiency, and whether the best use is being made of our resources;
> 3. To seek agreement upon ways of improving economic performance, competitive power and efficiency; in other words to increase the rate of sound growth.[33]

The NEDC consists of top level representatives of government, industry, and labor and has a staff that includes professional economists, persons on loan from private industry, and other specialists. It has published several reports which serve as basic documents in the development and implementation of the national plan and subsidiary plans for regions and industries.[34]

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[30] "DEA Progress Report" Department of Economic Affairs, No. 1, January 1965.

[31] *Lessons From Foreign Labor Market Policies*, Subcommittee on Employment and Manpower of the Committee on Labor and Public Welfare, U.S. Senate, 88th Cong., 2d sess., U.S. Government Printing Office, Washington, 1964, pp. 1386–1400.

[32] "DEA Progress Report" No. 3, March 1965.

[33] *Growth of the United Kingdom Economy to 1966*, National Economic Development Council, HMSO, London, 1963, p. viii.

Each industry council, like its national parent body, has tripartite membership. As of February 1965, "little neddies" had been established for 9 industries, and 11 more were scheduled to be set up by the end of the year. A major task of the industry councils is to look for weaknesses in their industries which are hindering expansion and exports and hampering competitiveness with imports in the domestic market. The first "action program" prepared by any of the "little neddies" was for the machine tool industry in June 1965. The report included the following recommendations affecting manpower and technological development:

1. Technical staff and particularly qualified engineers should be increased substantially and research and development intensified;
2. Government investment allowances should be revised or replaced by a system providing sharper and more immediate incentives to modernize the machine tool stock;
3. Government should state its readiness to purchase advanced prototype machine tools;
4. Government production contracts should encourage advanced methods by stipulating the use of new techniques in appropriate cases, such as numerically controlled machine tools;
5. Government and nationalized industries should set an example by examining the condition of machine tools in their own establishments and by planning vigorous modernization proposals accordingly;
6. Trade union members agree in principle to support the maximum use of high-productivity equipment and will prepare a report on increasing productivity.[35]

One of the byproducts of the establishment of various government planning bodies is the opportunity for close association and interchange of ideas, not only among representatives of different groups but also within industry and labor. A TUC official observed that as a result of sitting on the "little neddies," trade union representatives, in addition to becoming better informed about some of the problems in their industries, may learn to cooperate more with each other. Hopefully the experience will help to educate both management and union officials on the need for increased productivity.

Measures To Increase Labor Mobility

The relatively small increase in the labor force anticipated in Great Britain during the next decade has increased the need for the smooth redeployment of labor from declining to expanding industries, areas, and occupations. In the previous section the government's policies for regional and industrial development were discussed. In order to succeed, these policies must go hand in hand with a willingness on the part of workers to accept redundancy and to change occupations, firms, and, if necessary, place of residence, in order to accept new jobs. The government has in the past tried to assist workers in making the transition between jobs through the Employment Exchange and training programs in government centers. These facilities are being improved and expanded.

Removal Allowances. There are three programs designed to increase geographical mobility. The Resettlement Transfer Scheme, which is most used, covers unemployed or redundant workers who have no early prospects of finding suitable employment in their local areas and move to other areas where there is a labor shortage. Workers employed by a firm which moves to a development district with help from the Board of Trade, and whose services are necessary to establish the new enterprise, may benefit under the Key Workers' Scheme. As a complementary measure, unemployed workers, recruited in areas of high unemployment by firms setting up establishments there and sent temporarily to a parent plant for training, are covered by the Nucleus Labor Force Scheme.

The financial assistance given under all three programs has recently been improved to provide the following benefits: Travel fare to the new area for the worker; a settling-in grant of 5 pounds ($14); a lodging allowance of 70 shillings ($9.80) weekly to men living in lodging and continuing to maintain their homes; and travel fare home to a limit of six trips a year. In addition, the resettlement and key workers' schemes provide for payment of the family's fare and the cost of household removal to the new area, together with an incidental expenses grant of 30 pounds ($84) and a contribution of up to 75 percent of the total (subject to a maximum of 120 pounds—$336) toward costs incurred in buying and selling a house.[36]

Individual firms often go far beyond the government programs to induce workers to move to their plants in other areas or go with the firm when it changes its place of business. A recent account of one company's efforts in this regard was given in *The New Statesman:*

> Courting the Workers
>
> The traffic in key workers in Britain is getting a little desperate. The shortage of skilled trained men is as serious in the north as it is in the south. Employers who want to keep up are having to think big.

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[34] See *Conditions Favourable to Faster Growth, op. cit.*; *Growth of the United Kingdom Economy, op. cit.*; and *Management Recruitment and Development*, London, HMSO, 1965.

[35] *Financial Times*, June 11, 1965.

[36] "Labour Mobility: The Role of the Ministry of Labour," *British Journal of Industrial Relations*, July 1965.

> Nothing demonstrates this so well as the recent activities of Foster Wheeler, a heavy engineering firm which wants to uproot its crowded factory at Egham, Surrey, and move to the Hartlepools on the north-east coast. The company hired an aeroplane to airlift 30 employees and their wives north for a day's sightseeing. The aim was to persuade key workers (foremen, chargehands, and skilled men) to join the trek to the new site. The party had two jobs—to look around for themselves, and then report back to other employees at Egham. On this day the workers got red wine, roast beef, and a tour of the amenities on board a double-decker council bus with the mayor of West Hartlepool riding on the platform. "Thank heavens," said someone at the town hall, "that the sun is shining and has opened the masembryanthemum." He meant the little coloured daisies clustered along the promenade at Seaton Carew, the seaside suburb of the Hartlepools, where the party rested awhile.
>
> The new factory has still to be built, but Foster Wheeler has already started a brisk compaign to induce its key workers to abandon life in the stockbrokers' county for the thin fleshpots of West Hartlepool. Those who do eventually migrate will be offered removal expenses as well as 100 pounds ($280) disturbance money to pay for new carpets and curtains.[37]

The crucial factor affecting geographical labor mobility—and the one which is least likely to be overcome in the near future—is housing. Workers are usually unwilling to move to other areas if this means losing priority on housing lists or giving up a council house or rent-controlled accommodation. Local authorities, on the other hand, find it difficult to provide housing for incoming workers when they have waiting lists of their own residents for houses. It has been suggested that local authorities should be ready to build houses for incoming workers, encourage private building, and charge more realistic rents. The NEDC suggests that consideration be given to a special "industrial mobility" housing subsidy to provide a stronger financial incentive for local authorities to build houses for transferred workers. It also suggests extending to unemployed workers the "certificates of housing" now available for "key workers," and improving grants and allowances now available through the Ministry of Labour for workers willing to move to labor shortage areas.[38]

Retraining. One of the most important factors in occupational mobility is that workers have the necessary qualifications demanded by the available jobs. Most training is done by private industry, though the government has assumed a measure of responsibility for retraining adults whose skill is threatened by technological change or by the decline of an industry, and who need to acquire a new skill. Short intensive training in some 40 trades are offered at government training centers, with particular concentration on skills in short supply. However, in 1962, 42 percent of all trainees were in the metal trades. An additional 54 percent were in some 21 "miscellaneous" other occupations, limited almost entirely to skilled manual trades for male workers. There were no white-collar or service occupations for which training in government centers was offered, though financial assistance is given to those in need of help to train at technical colleges, for example. In 1963, only 3,700 persons (.015 percent of the labor force) completed government-sponsored training programs.

According to Dr. Margaret Gordon, who has made an exhaustive study of retraining and labor market adjustment in Western Europe for OMAT, training enrollments have been held down by the following factors: A compressed structure of wage differentials which limits incentive for retraining, union restrictionism, and a tradition of apprenticeship and on-the-job training. Training allowances in Great Britain in 1963 amounted to about 45 percent of average weekly earnings in manufacturing for a single man and 55 percent for a married man with two children. Relative to wages in the building trades, allowances were 59 and 72 percent of the minimum hourly rate for single and married bricklayers in London, and 70 and 84 percent for fitters.[39] Training allowances are free of income tax and trainees also receive travel allowances and a credit toward national insurance contributions.

In 1963, the NEDC noted that "comparatively few opportunities for retraining skilled workers who need to change their employer as well as their occupation are provided within industry."[40] It recommended a larger role for government in retraining. It pointed out that while training in government training centers was presumably open to all persons, whether employed or not, "in practice only disabled persons, exregulars and unemployed persons having difficulty in getting work undertake such courses."[41] The NEDC gave low training allowances and the attitude of craft unions as important reasons for this situation. The NEDC further recommended that training be given for a wider range of occupations and in areas of labor shortages, that special courses be given for married women with little or no previous industrial experience, and also for those who wish to return to work and need only refresher training.

The NEDC expressed "considerable doubts whether the existing apprenticeship system with its traditional craft divisions, quota systems, and lack of standards and tests, can meet the needs of an expanding economy characterized by a more rapid introduction of new techniques, materials, and methods." It recommended "a thorough overhaul of the apprenticeship system."[42] It also pointed out that a large number of young workers enter employment in occupations other than the accepted crafts, and that there is a considerable field for improvement in training arrangements for these young people as well as for operatives, office staffs, supervisors, technicians, and technologists.

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[37] *The New Statesman*, Sept. 17, 1965.

[38] *Conditions Favourable to Faster Growth, op. cit.*, p. 11.

[39] M. Gordon, "The Comparative Experience With Retraining Programs in the United States and Europe," in *Employment Problems of Automation and Advanced Technology: An International Perspective*, J. Stieber, ed., Macmillan & Co., London (scheduled for publication in 1966).

[40] *Conditions Favourable to Faster Growth, op. cit.*, p. 7.

[41] *Ibid.*

The Ministry of Labour has stated that a major expansion of government facilities has been going on since early 1964. At the end of 1965 there were 30 centers with a capacity for training 11,000 to 12,000 persons annually (about 0.04 percent of the labor force). A further program of expansion, including new centers and additional places so that centers will be capable of producing some 15,000 trained men annually, has been started. In the long run, the government hopes that training in private industry will expand greatly as a result of the Industrial Training Act of 1964.[43]

Industrial Training Act.[44] In order to increase and improve training of workers, the Conservative Government, in one of its last acts, authorized the Minister of Labour to establish industrial training boards with authority to finance their activities by a levy on employers. While the amount of the levy is not specified in the Act, in one industry it amounts to about 2½ percent of payrolls. Employers are entitled to receive rebates on the basis of expenditures for training and related activities. The Act was supported by both the employers' organizations and the Trade Union Congress.

An Industrial Training Board is supposed to provide, or arrange for others to provide, courses and other facilities to train persons employed, or who intend to be employed, in the industry; make recommendations regarding the nature and length of training and persons who should receive or provide training; set training standards; assist persons in seeking training; and conduct or assist in the carrying on of research on training. They may pay maintenance and travel expenses to trainees, make grants or loans to persons providing approved training courses or other facilities, and pay fees to those furnishing further education through approved courses.

In addition to funds derived from a levy on employers, a training board may receive grants or loans from the Minister of Labour and borrow funds to help finance its operations. Employers must maintain records and furnish such information as may be required by a board and the Minister of Labour. Compliance may be enforced by fine and imprisonment or both.

Industrial training boards include both employer and employee representatives, educational members appointed in consultation with the Secretary of State for Scotland and the Minister of Education, and a chairman with industrial or commercial experience. A Central Training Council, also tripartite in membership, serves in an advisory capacity to the Minister of Labour.

Despite the Act's impingement on what might well be considered traditional management functions—deciding the extent and cost of training—employers seemed to welcome it. At least this was true of the officials of the larger companies with whom we met. They felt that many of the larger firms had long been training employees at considerable cost, only to lose them to other employers who either did not choose to conduct training programs or could not afford to do so. Now these "free-riders" would at least be taxed for training in the industry, while those employers with extensive programs would be reimbursed for expenditures on training. Not one employer raised any objection to the principle of government determining how much should be spent on industrial training and becoming intimately involved in courses, standards, and other aspects of training carried on within industry.

Redundancy Payments Act.[45] The measures outlined above are designed to assist workers find jobs, help them overcome financial obstacles to accepting new employment, and prepare them to perform the jobs in a satisfactory manner. But these efforts can only be of limited value as long as workers have a deep-rooted resistance to any form of change which might ultimately result in some loss of employment. As noted earlier, worker and union attitudes towards change have been held responsible for overmanning in industry and reluctance by employers to introduce new equipment and technology that would increase productivity but might result in some redundancy.

Proceeding on the assumption that a more ready acceptance of change is dependent upon assurance to workers that the problems of redundancy are recognized and that loss of employment will be compensated, the Labour Government proposed and the Parliament passed the Redundancy Payments Act in 1965. The Act provides for compensation as a legal right to workers losing their jobs through redundancy. It applies to employees aged 18 to 65 (60 for women), who normally work 21 hours a week or more and have a minimum of 2 years' service with their employer. Payments will be made on the following scale:

Age	*Pay for each year of service* (in weeks)
18 to 21	½
22 to 40	1
41 to 65 (60 for women)	1½

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[42] *Ibid.*, p. 9.

[43] "Labour Mobility: The Role of the Ministry of Labour," *op cit.*, p. 6; also letter from Ministry of Labour, Dec. 13, 1965.

[44] "Industrial Training Act of 1964," HMSO, London, 1964.

[45] *Redundancy Payments Bill* (as amended by Standing Committee D), London, HMSO, 1965.

Qualifying service is limited to the last 20 years before redundancy, and earnings above 40 pounds ($112) per week will not be taken into account. This puts a maximum of 30 weeks and 1,200 pounds ($3,360) on payments to any individual.

Employers are responsible for making the payments, but a central redundancy fund will be set up to help spread the cost of payments over industry as a whole. This fund is to be financed by a surcharge of 5 pence (6¢) for men and 2 pence (2.3¢) for women on the employer's weekly National Insurance Contribution. Employers will be able to claim rebates from the fund, averaging about 60 percent of the total payments made. The rebate schedule is set up so as to reimburse employers in toto for the extra half week's pay for years of service for persons over 40 years of age, thus avoiding heavier costs for employers hiring older workers.

The coverage is broad, including even domestic servants in private households except when they are close relatives of their employers. The main excluded groups are share fishermen, registered dockworkers, crown servants (who will be given comparable treatment), and the Armed Forces.

Where there is an agreement between employers and unions for redundancy payments to workers, the Minister of Labour may, on application of the parties, exempt employers from liability to make payments under the Act to employees covered by the agreement. This provision was designed to make it possible for industries in which many workers do not work for long periods with one employer (e.g. the building trades) to agree on special schemes more suited to their conditions.

Payments will be made to workers who lose their employment because the work they are doing comes to an end or is reduced, or when jobs are lost because of the death of the employer. Workers will also be eligible for redundancy payments if they are laid off or put on short-time work, where they receive less than half a normal week's pay for a period in excess of 4 weeks (or for an aggregate of 6 weeks in any 13-week period). However, redundancy payments will not be made if the employer can show that there was "good reason" for the layoff or short-time to continue, or that there was a reasonable expectation that full-time work would be resumed within the next 4 weeks and would continue for at least 13 weeks.

Employees will not receive payments if they "unreasonably" refuse an offer either of a renewal of their contract or of suitable alternative work with the same company, provided the offer is made before notice has expired and the alternative employment is to start within 4 weeks. Industrial disputes will not affect eligibility for redundancy payments, but time spent on strike will not count as qualifying service. In case of disputes over questions relating to continuity of service or cause of dismissal, the employer will have to prove that the service was not continuous or that the worker was not dismissed because he was redundant within the meaning of the Act.

It is too early to say what effect the Redundancy Payments Act will have on redundancy plans previously negotiated with trade unions or put in effect by employers but not embodied in an agreement. Since very few of these plans provide more liberal benefits than those provided by law, they will probably be supplanted by the new legislation. However, unions will undoubtedly press for employers to supplement payments required by law to provide for a more liberal schedule of benefits. The most important effect of the law is to extend to practically all employees redundancy payments which, heretofore, had been provided for only a relatively small proportion of the total labor force.

Although the bill received support from both the TUC and the Confederation of British Employers, there was considerable skepticism as to whether it would have the desired effect of inducing greater labor mobility by increasing the willingness of workers and unions to accept redundancy. On the other hand, it was pointed out that employers may be reluctant to dismiss workers because of the cost incurred by the required redundancy payments. The fact that all employers will be taxed to finance the fund and will receive rebates averaging 60 percent of total payments was expected to counter such an effect. In fact it is hoped that employers will be encouraged to let unnecessary workers go by the feeling that since they are paying to finance the program, they may as well take advantage of it.

Unemployment Insurance and Old Age Pensions [46]

Unemployment insurance covers all employees but is optional for married women. Unemployment benefits for a married man with two dependent children amount to $23.40 a week, or about 45 percent of average weekly earnings of male manual workers in manufacturing as of October 1964. Duration of payments is 26 weeks with possible extension to an overall maximum of about 70 weeks for those insured for more than 5 years. After exhaustion of his claim a worker regains benefit rights after 13 weeks of work.

Consideration is being given to the introduction of wage-related unemployment insurance benefits to replace the present system of flat-rate benefits which are not related to earnings. The NEDC believes that unemployment benefits are too low in relation to earnings to provide adequate financial protection against redundancy. With a uniform flat-rate contribution and benefit scheme, it is not possible to raise the benefit to a level which higher paid workers would regard as satisfactory without, at the same time, putting too heavy a contribution burden on lower paid workers and raising the benefits too close to the earnings of such workers.[47] While there is considerable support for such a revision of the existing system, putting it into effect would require educating the public on the reasons for the change and detailed study of the complex financial and administrative problems involved in setting up a graduated scheme. Such a study has been underway, and the new approach is likely to be adopted in the near future.

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[46] *European Social Security Systems*, Joint Economic Committee, 89th Cong., 1st sess., U.S. Government Printing Office, Washington, 1965.

There is both a flat-rate and a graduated old-age pension. Payments normally begin at age 65 for men and 60 for women, with retirement from work required during the first 5 years. The flat-rate pension pays the same benefits as unemployment insurance and cash sickness—$23.40 per week. The graduated pension is intended as a supplement for higher paid workers for whom the flat-rate pensions would be obviously inadequate. Both the employer and the employee contribute towards the graduated pension. An employer may "contract out" and maintain his own supplementary retirement plan.

Both unemployment insurance and old-age pensions, as well as cash sickness and maternity benefits, are financed by equal contributions of employers and employees, with the government making up the difference in cost of the comprehensive social security system.

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[47] *Conditions Favourable to Faster Growth, op. cit.*, pp. 12–13.

Chapter 3. France

By exposing French industry to outside competition, the Common Market has served as the greatest stimulus to modernization; limited availability of capital and the predominant influence of small- and medium-size enterprises in many industries are considered to be the major obstacles to automation. Other factors having a positive influence in France are government pressures and financial assistance for modernization of industry, the predominance of technically trained men in positions of influence, and French planning. On the negative side are low expenditures on research and development and lack of support for research generally, and overheating of the economy resulting in introduction of stabilization measures which have tended to put a brake on growth since 1963. The French tend to compare themselves most often to West Germany, and the predominant view is that French industry comes off second best in this comparison.

Influence of Management and Government on Technological Development

In the larger companies and particularly in heavy industry, French production and technical management is composed almost exclusively of engineers. Even in such areas as finance, accounting, sales, and personnel, there is a preference for men with engineering training, and higher education is virtually a job requirement. The stress on engineering training is reflected in the relatively high proportion of management and white-collar employees in production and technical services as compared with the British who, as we have seen, tend to have a higher percentage in nontechnical departments.[1]

In almost all firms operating on more than a regional scale, the upper echelons are recruited exclusively from graduates of a few schools such as the Ecole Polytechnique and the Ecole Centrale. Academic standards are very high in these schools, but a combination of French social-class traditions and the requirements for taking the competitive admission examinations result in considerable class rigidity in the upper ranks of management. The barriers between these upper echelons and lower management personnel are almost impossible to bridge in many industries, not to speak of the cleavage between management personnel and all other workers, whether blue or white collar. Many of the top managers come to their positions only after having served 10 to 20 years in the civil service, which is held in high esteem as a career. These are the crème de la crème, having probably graduated from one of the "great schools" near the top of their class, gone directly into the civil service, and left for a high business post when in their forties or fifties. Granick considers the source of recruitment of top French management a major reason for the success of French planning. The top planners in government and industry are often former schoolmates and former colleagues who understand each other and have no difficulty working closely together.

Whatever one may think about the preparation of French management from a social viewpoint, it probably results in business decisionmakers who are technically qualified to recognize, appreciate, and take full advantage of modern technology. Their greatest shortcoming, according to the French sociologist Michel Crozier, is their lack of human relations skills and inability (and perhaps unwillingness) to communicate with their workers.[2] This may explain the difficulty often encountered by employers in getting acceptance of technological change by French workers and unions, even though alternative employment opportunities are generally available for displaced employees.

The government's role in promoting increased productivity and modernization of heavy industry after the war was noted earlier. In 1955 the government established the Economic and Social Development Fund which had a dual objective: Providing financial incentives to industry to improve production facilities, and assisting workers who might be adversely affected by technological change. For workers made redundant and forced to move to new locations, funds were provided for travel, transportation for themselves and their dependents, transfer payments, and reinstallation allowances.

On the other hand, the government has not given much financial support to research and development. In 1960 it spent only 1.1 percent of its gross national product on research and development, which was less than any of the other four countries studied. United States expenditures on R. & D. in 1960 came to 2.8 percent of GNP. The French record is surprising in view of its relatively high expenditures for defense which would be expected to have a positive influence on R. & D. Indeed, as much as 40 percent of total French outlays for research in recent years has been for military purposes.[3] While the lag in R. & D. expenditures apparently did not hold back economic growth in the 1950's, it may have a negative effect on future growth.

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[1] D. Granick. "Management in European Heavy Industry," *Steel Review*, October 1962, pp. 23–29.

[2] M. Crozier, "General Outline of a Depth Study on French Planning Methods" (mimeo, undated).

Manpower Policy and French Planning

Manpower policy in all countries is bound up with economic and social policy as a whole. In France this means that manpower policy is formulated and applied as part of the general plan for the entire economy. Before considering the elements of manpower policy we must therefore consider briefly the objectives and organization of French planning.

France started what has come to be called "indicative" (as opposed to directive) planning shortly after the war. The First Plan of Modernization and Equipment covered the period 1947–53 and had as its major objective the reconstruction of the French economy. It concentrated on productive investment with special emphasis on the basic industries. It was followed by the Second Plan, 1954–57, and the Third Plan, 1958–61, which extended to all fields of economic activity. Some of the mandatory objectives of the First Plan were abandoned with the relaxation of economic restraints and a return to a greater degree of economic freedom. The Fourth Plan, which covered the period 1962–65, was called the Plan for Social and Economic Development. The planning process in France may be described in terms of the approach used to work out the Fourth Plan.

Preparation of the plan, which was to become operative in January 1962, started sometime in 1960. The process began with a report from the General Planning Commission, the top permanent planning authority which consists of about 30 civil servants working under the direction of the general director (currently Pierre Massé, who is scheduled to leave this position at the end of 1965). This body is responsible for the original conception of the plan; it maintains close contacts with representative groups, is in charge of executing the plan, and presents an annual report of progress. The commission's report is first submitted to the Economic and Social Council, which has tripartite representation, for consideration of the major objectives: Consumption and investment targets, economic growth, etc. Having considered the views of the Economic and Social Council, the government determines the annual growth rate for the economy, which is to be used as a basis for the work of the various planning committees.

The second element in the planning organization are the modernization and equipment committees, consisting of representatives from government, unions, employers, professional organizations, and experts. These serve as "working groups" to develop parts of the plan and are divided into vertical committees established on an industry basis (e.g., iron and steel, power, transportation, agriculture, etc.) and horizontal committees which cut across industry lines (e.g., finance, manpower productivity, etc.).

A General Economic and Financial Committee coordinates the work of the various committees and the ministries involved in the preparation of the plan. The committees submit reports which are advisory to the government, and are not binding on committee members. The government makes the final decision, but is not obliged to accept the recommendations of the various committees.

The Manpower Committee has about 50 members drawn from universities and research groups, industry and employer organizations, professional associations, trade unions, the armed forces, youth organizations, rural and social institutions, and officials of the Ministries of Labor, Finance and Economic Affairs, Education, Industry, Agriculture, Public Health and Population, and Construction. It is responsible for determining the necessary conditions to maintain full employment, forecasting productivity trends in each industry, and estimating manpower requirements. The committee also considers skill requirements and occupational shortages which then serve as guides for developing the vocational training aspects of the plan. In the Fourth Plan, manpower requirements for 21 regions were prepared to assist in the preparation of programs for industrial development and labor mobility.

The final draft of the plan, as prepared by the General Planning Commission, is submitted to the Higher Council of the Plan, which is composed of top-level representatives of government, employers, trade unions, and specialists, for suggestions and possible revisions. Despite its title, this council has only advisory power. The plan is then submitted for a second time to the Economic and Social Council for a final review. It next goes to the Council of Ministers for approval and is presented to Parliament for adoption and promulgation.[4]

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[3] *Some Factors in Economic Growth in Europe During the 1950's*, Economic Commission for Europe, United Nations, Geneva, 1964, ch. V, p. 5.

The above procedure was followed in preparation of the Fourth Plan, and revised for the Fifth Plan so that Parliament, instead of coming in only at the final stage, would also have an opportunity to voice its views at the outset on such matters as the proposed rate of expansion for the economy, regional development, production, consumption, and investment targets. The new procedure was considered more democratic and was also designed to promote more public discussion on the major issues involved in the plan. At the time this paper was being written, the Fifth Plan was being readied for final presentation to the Parliament during the fall of 1965, 8 months after the "broad options" of the plan were originally submitted to that body for review and suggestions.

The plan as it finally emerges is supposed to guide, but not control decisions by industry, labor, and government. However, the government has ample means at its disposal to "induce" if not "force" adherence to the plan. It has its own public investment schemes, which are substantial and have an important multiplier effect on the economy. It can, if it wishes, control the production of nationalized firms, though it has not often used this power. The government can exercise indirect pressure on the private sector by the way it allocates government contracts and agrees to match private investments with government funds. It also has power to control prices and authorizations for capital expenditures. Certain tax privileges may be granted to help achieve the plan's objectives, such as exemptions or reductions of taxes to firms participating in approved reconversion and rationalization programs, and special tax treatment of funds devoted to scientific and technical research. Through its Manpower Redistribution Fund, the government can give financial aid to undertakings which organize retraining programs for reconversion, concentration, or decentralization of operations. The government can also refuse loans to industry or otherwise discourage investment which may hinder the plan's objectives.

The trade unions have been critical of French planning, but all three major federations participate in the planning process. The non-Communist unions, the CGT–FO and the CFTC, following a "policy of presence," have participated in French planning from the beginning. (In the fall of 1964 the CFTC [French Confederation of Christian Workers] split into the CFDT [French Confederation of Democratic Labor] and a minority group which retained the original name.) The largest union federation, the CGT, which is Communist dominated, participated for the first time in the preparation of the Fourth Plan. In general the unions would like the government to take more vigorous action to achieve the objectives of the various plans. The CGT–FO put it this way: "The task is not only to forecast the weather but to change it."[5]

In 1960 some unions favored making the plan "obligatory." However, support for this position petered out when they realized that an obligatory plan could also be used to force certain policies on unions that they found objectionable; e.g., an incomes policy.

Unions have also been unhappy with the relatively minor influence they have had in determining the contents of the various plans. It is estimated that in the preparation of the Fourth Plan, union representatives amounted to about 9 percent of all members participating in the various modernization and equipment committees. While they do not necessarily demand, nor could they provide, the necessary men to obtain equality, they would like to have their representation enlarged. It is generally agreed that trade union influence on the programs developed in the vertical industry committees is minimal because they lack qualified specialists. It is probably more significant on some of the horizontal committees, especially in the manpower field. But even here, a union spokesman considers labor's representation "merely symbolic."[6]

Employers initially were not very happy at the prospect of the large role undertaken by government in guiding the economy. However, they had no alternative after the war as they were completely dependent on the State for reconstruction of the economy. Things turned out much to their liking as industry had a major role in the Second and Third plans. With the advent of the Fourth Plan, however, the unions were brought into the planning process to a much greater extent, and government became much more active in forcing its views on industry. This has continued in developing the Fifth Plan, causing some concern to employers. They fear that the government, for political reasons, especially during an election year, is catering more and more to the unions. However, they recognize that they have an important champion in the current Minister of Finance, whose views are considered to be substantially those of French employers. In the last analysis, the Employers' Confederation believes that planning in one country has serious limitations, and that in order to be successful it must be extended to the Common Market as a whole.

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[4] L. Lucas, on France, in *International Trade Union Seminar on Active Manpower Policy: Supplement to the Final Report*, Vienna, Sept. 17–20, 1964; OECD Manpower and Social Affairs Directorate, pp. 7–28; additional information from a draft on adjustments to technological change in France, prepared by the Automation Division of the International Labor Organization.

[5] *F.O. Information Bulletin*, October 1963.

[6] Lucas, in *OECD Trade Union Seminar*, *op. cit.*, p. 12.

An important byproduct of planning is the involvement in the planning process of several thousand persons representing all groups in the population. It is hoped that through frequent and close association the representatives of various interest groups learn to understand and appreciate each others' views. All the individuals to whom we talked, regardless of their affiliation, were agreed on the educational value of planning as practiced in France.

Three of four major objectives of the Fifth Plan, to be achieved by 1970, deal with manpower and technological development:[7]

1. Increase the capacity of adult training centers from 51,500 to 74,500.
2. Encourage technical innovation by means of a substantial increase in research, both fundamental and applied, by doubling the credits devoted to civilian research and by providing public assistance of 600 million francs ($120 million) for development research. The major effort however must come from private enterprise.
3. Reduce maximum weekly hours of work from 60 to 54 (with premium pay continuing to be paid for all hours over 40).

The fourth major goal is to increase export trade in order to balance anticipated imports. The plan calls for a 5-percent annual growth rate, an average annual reduction of the workweek by 1.30 hours, holding price increases to 1.5 percent per year on the average, and increasing expenditures for research and development to 2.5 percent by 1970 as compared with 1.7 percent in 1963. These objectives were to be finalized by parliamentary action in the fall of 1965.

Table 6 presents the manpower balance sheet for the Fifth Plan, showing actual changes since 1954 and projections to 1970. It shows that the labor force available for civilian employment remained stationary at 19,200,000 from 1954 to 1962. During this period the active population actually increased by 870,000 as a result of natural population growth and entrance of more women into the labor force. However, withdrawals due to rising school attendance and a decrease in the number of older workers resulted in a net increase of only 200,000, which was exactly balanced out by greater military requirements. From 1962 to 1970 the labor force is expected to increase by 1,150,000 workers (0.7 percent per year) after taking account of various factors. A similar breakdown is also shown for the period 1965–70.

TABLE 6. ACTIVE POPULATION IN FRANCE, 1954–70

Designation	Active population	Contingent military	Active population available for employment
1954	19,500,000	300,000	19,200,000
Variation 1954–62:			
Natural population movement	+770,000	---	---
Increase in school attendance	−370,000	---	---
Decreased activity of aged	−300,000	---	---
Growth of women in labor force	+100,000	---	---
1962	19,700,000	500,000	19,200,000
Index (1954=100)	101.0	---	100.00
Average annual variation, 1954–62 percent	0.1	---	0
1962	19,700,000	500,000	19,200,000
Variation 1962–70:			
Natural population movement	+1,400,000	---	---
Increase in school attendance	−750,000	---	---
Decreased activity of aged	−500,000	---	---
Women in labor force	+100,000	---	---
Immigration	+700,000	---	---
1970	20,650,000	400,000	20,350,000
Index (1962=100)	104.8	---	106.0
Average annual variation, 1962–70 percent	0.6	---	0.7
1965	20,100,000	300,000	19,800,000
Variation 1965–70:			
Natural population movement	+900,000	---	---
Increase in school attendance	−575,000	---	---
Decreased activity of aged	−225,000	---	---
Women in labor force	+100,000	---	---
Immigration	+350,000	---	---
1970	20,650,000	300,000	20,350,000
Index (1965=100)	102.7	---	102.8
Average annual variation, 1965–70 percent	0.5	---	0.55

SOURCE: Annex No. 1, preparation of the Fifth Plan, report on the principal options, *Official Journal of the French Republic*, Paris, 1965.

Industrial and Regional Employment Trends

In chapter 1 we noted that West European countries experienced substantial changes in the distribution of employment during the 1950's and early 1960's among economic sectors and different branches of manufacturing. In France this trend continued up to 1965 and was expected to persist into the future. Table 7 shows actual shifts in employment among agriculture, industry, and services during the last 6 years.

Table 7 indicates that declining agricultural employment and new entrants into the labor force have both made substantial contributions to industry and trade and services. The increase in employment in the industrial sector was just about enough to keep pace with the overall growth in the labor force. Trade and services, on the other hand, raised its proportion of total employment to more than 41 percent. Thus France, like the United States, is now utilizing more manpower in production of services than in industrial products.

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[7] *Le Monde*, Paris, July 31, 1965.

TABLE 7. EMPLOYMENT IN FRANCE BY MAJOR ECONOMIC SECTORS, 1959–65

Major sector	Employment (000's)		Difference (000's)	Index (1959=100)	Percentage distribution	
	1959	1965			1959	1965
Agriculture and forestry	4, 540	4, 100	−440	90	24. 1	20. 9
Industry	7, 092	7, 460	+368	105	37. 6	38. 0
Trade and services	7, 208	8, 060	+852	111	38. 3	41. 1
Total	18, 840	19, 620	+780	104	100. 0	100. 0

SOURCE: B. Vrillon, "Active Manpower Policy in France," in *International Management Seminar on Active Manpower Policy*. Brussels, p. 14–17. Manpower and Social Affairs Directorate, OECD, April 1964, p. 36.

A recent article by a French economist, H. Perroy, discusses the shifts in employment in different branches of industry between 1954 and 1962 and projects manpower requirements 20 years ahead, as shown in table 8.

TABLE 8. VARIATION OF INDUSTRIAL EMPLOYMENT IN FRANCE (1954–62) AND PROJECTIONS TO 1985

Branch	Thousands		Index 1962 (1954=100)	Index 1985 (1962=100)
	1954	1962		
Textiles	664. 9	545. 4	82	90
Clothing	524. 4	421. 1	80	
Leather products	239. 9	198. 7	83	
Wood, furniture	314. 7	282. 8	89	90
Iron smelting	219. 5	246. 3	112	90
Primary metal industries	362. 0	419. 1	115	130
Mechanical machinery and appliances	581. 6	717. 5	123	140
Electrical machinery and appliances	212. 5	319. 5	150	200
Automobiles and cycles	235. 2	298. 6	126	120
Naval construction, aircraft, armaments	161. 0	182. 2	113	150
Chemicals and rubber products	307. 4	356. 6	116	120
Construction and public works	1, 317. 6	1, 584. 8	120	110

SOURCE: H. Perroy, "Réflexions Pour 1975" in *Études et Conjoncture*, March 1964.

Four industries showed absolute decreases in employment of 11 to 20 percent, while the others increased employment during the period 1954–62, ranging from 12 percent in iron smelting to 50 percent in electrical machinery and appliances. By 1985, Perroy expects further decreases of approximately 10 percent in 5 industries with 1,500,000 workers, and increases of 10 to 100 percent in other industries which together employed somewhat less than 3,900,000 persons in 1962.

The Manpower Committee of the Fourth Plan forecast the balance of manpower resources and requirements for each of the 21 regions in France in 1965. "Substantial surpluses" of manpower were anticipated in the west and a somewhat lesser surplus in the central and southwest regions. A shortage of manpower was expected in the east of France, the regions not far from Paris and, above all, in the Paris region, itself, which alone was expected to have a labor shortage of 300,000. In summary, 15 regions were expected to have an excess supply of labor, while 6 were marked as labor shortage areas.[8]

With regard to the occupational distribution of manpower in industry, the Fourth Plan foresaw a 15-percent increase in the number of engineers between 1959 and 1965, and a further rise of 28 percent by 1975. Roughly similar increases were projected for other executive, technical, white-collar, and skilled occupations, while the number of unskilled workers was expected to remain almost stationary in absolute terms, and decrease significantly as a proportion of total employment. The breakdown by occupation is shown in table 9.

Unforeseen developments during the course of the Fourth Plan had a significant impact on labor supply and demand. The first year of the plan, 1962, was marked by an inflow of repatriates following the accession of independence by Algeria. As a result, the labor market was characterized by a substantial increase in available manpower, and the active population rose by over 500,000, including 280,000 from Algeria, 113,000 permanent foreign workers, and 130,000 released from military service. However, the increase in employment was also greater than forecast and unemployment did not rise. The labor bottleneck became easier, but the shortage of skilled personnel was as acute as ever.[9]

TABLE 9. BREAKDOWN BY OCCUPATION IN FRENCH INDUSTRY, 1959, 1965, AND 1975

Category	In thousands		
	1959	1965	1975
Engineers and the like	105	121	155
Other senior executives	67	80	99
Technicians and draftsmen	222	275	377
Supervisory grades	231	256	344
Office staff	660	717	839
Skilled workers	2, 165	2, 401	2, 794
Unskilled workers	3, 060	3, 170	3, 282
Total	6, 510	7, 025	7, 890

SOURCE: B. Vrillon, on France, in *International Management Seminar on Active Manpower Policy: Supplement to the Final Report*, Brussels, Apr. 14–17, 1964, OECD Manpower and Social Affairs Directorate, p. 64.

The changing structure of employment obviously called for, and will continue to demand, considerable adjustment and mobility on the part of French workers. The employment changes outlined above represent the combined effects of increased competition resulting from establishment of the Common Market and technological developments: The two, of course, are inextricably bound together. In view of the anticipated problems reflected in the industrial, regional, and occupational manpower requirements, the Fourth Plan proposed a series of measures to increase vocational training, encourage labor mobility, induce industry to stay out of the Paris area, and create new employment opportunities in labor surplus regions, and improve the operations of the Employment Exchange. Before discussing recent manpower developments, we shall examine an important aspect of government labor policy which dates back to the war period and is still in effect: the legislation regulating dismissals and layoffs.

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[8] B. Vrillon, on France, in *International Management Seminar on Active Manpower Policy: Supplement to the Final Report*, Brussels, Apr. 14–17, 1964, OECD Manpower and Social Affairs Directorate, pp. 36–37.

[9] *Ibid.*, pp. 41–42.

Regulation of Dismissals and Layoffs

French employers are not completely free to dismiss employees for economic reasons. They are required by law to give employees with 6 months or more of continuous service at least 1 month's notice or pay in lieu of notice. Prior to passage of this law in 1958, the customary notice of termination of employment in most manual occupations was 1 week and it applied equally to employers and employees. Under the 1958 law, there is no specified notice required of employees except as fixed by collective agreement. A 1-month notice requirement—4 times that fixed by the British law for employees with less than 2 years' service—can serve as a substantial deterrent to dismissal and, in practice, is often resolved into a type of severance pay. The coverage of the law is broad, applying even to construction, agriculture, and domestic service.[10]

Even more far-reaching then the individual notice requirement is the 1945 law regulating layoffs for economic reasons. This law, which was originally designed "to permit orderly control of labor markets," requires that all dismissals be approved by the Inspectorate of Labor. A 1962 Ministry of Labor circular states that the law should be used to avoid consequences "often unhappy for wage earners" even when the employment situation is such as to permit rapid reemployment.[11] Notification is merely pro forma in individual dismissals for noneconomic reasons, as the labor inspector has no authority to disapprove such dismissals. However, before making reductions in force for economic, organizational, or technological reasons, an employer must first consult the Works Council in his establishment and then obtain permission from the Employment Service. The role of the Works Council is purely consultative as it has no power to prevent the dismissals.

The law requires an employer to set forth in the establishment's work rules or in a collective agreement with his union the principles which will govern the order of economic dismissals, taking into account seniority, number of dependents, and employee qualifications. The employer must adhere to these rules in making dismissals. The inspector, upon notification of an intended dismissal, verifies the alleged reasons for the dismissal, makes sure that the Works Council has been consulted and given an opportunity to suggest alternatives, and determines what the impact will be on the local labor market. He may propose alternatives to the employer or even deny permission if the employer refuses to adopt reasonable suggestions to avoid the dismissals; e.g., retraining with government aid, reduction of the workweek, normal attrition to reduce the work force, etc. Denial of permission to proceed with a dismissal by the inspector is subject to administrative appeal to the Minister of Labor. The inspector has the authority to revoke permission to work regularly scheduled overtime which is required under a pre-World War II law for work in excess of 40 hours per week. He may not authorize dismissals for some workers while others are doing similar work on an overtime basis.

The employer must submit to the inspector a list of the employees to be dismissed. The inspector may check the list for conformity to plant rules and suggest alterations. He may also ask the employer to make changes in the list in order to avoid dismissal of workers who may have great difficulty in finding other jobs, such as elderly or physically handicapped workers. According to Professor Meyers' study of job security provisions in France, inspectors often withhold permission until placements of dismissed workers have been arranged. Employers are expected to assist in this process and are considered to have an obligation to help find employment for workers about to be dismissed.

If an employer insists on going ahead with dismissals without the inspector's permission, he may be subject to penal sanctions. However, according to one trade union spokesman, "the law does not give a clear ruling on the consequences of a refusal to authorize dismissals," or of an employer's overriding such a refusal and going ahead with the layoffs.[12]

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[10] F. Meyers, *Ownership of Jobs: A Comparative Study*, Institute of Industrial Relations, University of California, Los Angeles, pp. 66–67.

[11] *Ibid.*, p. 64.

[12] Lucas, in *OECD Trade Union Seminar*, *op. cit.*, p. 13.

Nevertheless, the inspector is in an excellent position to delay the dismissals although he will almost always give his approval eventually. In some cities, employers may have considerable difficulty in securing approval, while in others inspectors approve dismissal requests routinely. The extent of union organization, prevailing traditions with regard to employer-employee relations, and the state of the labor market are all factors influencing an inspector's handling of dismissal requests.

There are frequent cases of inspectors being subjected to pressures from unions, local officials, the church, and politicians. In 1960, a layoff was scheduled in the Renault Automobile Works. The union tried to dramatize the situation by strikes and demonstrations of various kinds. The layoff was delayed, but eventually the Minister of Labor gave his approval. In another case, in Rheims, an employer was induced by a threat of adverse publicity to reduce his layoff list from about 15 to 8 percent of the work force.[13]

During the entire 20-year period that the law has been in effect, France has had a high level of employment and a relatively tight labor market situation. Under such circumstances, labor inspectors would rarely be inclined to deny approval for layoffs based on reasonable grounds. The real effect of the law may be felt if unemployment were to increase and alternative employment opportunities were not readily available to dismissed workers. Even under conditions of full employment, however, the law appears to have been used, on occasion, to delay layoffs, to schedule them over a longer period of time in order to ease the impact on the labor market, or to reduce the number of dismissals.

Union representatives believe that the law is of limited value and that it rarely serves as a serious impediment to economic layoffs. They say that it is difficult to enforce due to inadequate staffing of Labor Inspectorates, which precludes proper investigation of reasons for layoff and the impact on the community and the labor market. Works Councils do not wish to be held in any way responsible or be considered a party to dismissals, whatever the reason. They invariably take the position that layoffs are unjustified and lodge a protest with the labor inspector. This attitude is quite different from that of Works Councils in Germany, as we shall see in the next chapter.

French employers generally try to avoid layoffs and, in fact, are often guilty of hoarding workers during slack periods for fear they will be unable to recruit sufficient employees when operations resume at a higher level. There is also a feeling that having to lay off workers is a sign of poor management and reflects on the public image of the employer and the enterprise. Still, employers would prefer to be free to decide, without government approval, when economic conditions call for adjustments in their work force. A representative of the French Employers' Association has stated that the law as it stands today "seems ill adjusted to our present economic situation."[14] He suggests that the regulations should at least be reformed to allow for the existence of collective agreements which deal with questions of recruitment and dismissal. An example of such an agreement is found in the textile industry. To adjust to modifications made necessary by modernization of equipment, improved techniques and working methods, new products, and changes in markets, the textile agreement requires preliminary consultation and study of changes with staff representatives; it also provides special severance allowances in case of dismissal and compensation for partial unemployment as well as for reconversion and resettlement under the government's Economic and Social Development Fund.[15]

Severance pay, work sharing, and consultation to consider alternatives to layoffs are provided in a number of collective agreements. Most agreements also give reemployment priority to laid-off workers for 6 months or 1 year after separation. Severance pay provisions generally make no distinction between reductions in force for economic and technological reasons. They are generally limited to workers with a specified minimum period of service, often 5 years, and the amount of the benefit is graduated with length of service, generally up to a maximum of 3 months' pay. Many agreements provide specifically that layoffs will be resorted to only as a last resort, and a few forbid layoffs so long as hours of work are in excess of 40. (The average workweek in France is about 46 hours, with premiums being paid for work in excess of 40.)

The agreement at Renault, negotiated in 1958, set up a special fund based on employer contributions to compensate workers whose schedule is reduced below 48 hours a week. The first hour of reduction below 48 is paid for at the full rate, and the next 6 hours at half the amount the worker would have earned had the schedule not been reduced. The Renault agreement has been followed in some large metalworking plants and particularly in the automobile industry.

Another agreement, negotiated in a shoe plant in 1960, resembles the Kaiser Steel-United Steelworkers contract in some respects. It provides that no regular employee will be dismissed during the life of the agreement, except for disciplinary offense. In return the firm was given great freedom in work assignments and in making changes in job content. This agreement also contains a type of profit-sharing arrangement.[16]

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[13] Meyers, *op. cit.*, p. 66.

[14] Vrillon, in *OECD Management Seminar, op. cit.*

[15] *Ibid.*, pp. 43–44.

Unemployment Insurance and Old Age Pensions

The French social security system does not include unemployment insurance. There are, however, "unemployment allowances" which are paid by the state and financed by a National Unemployment Fund, established under an act of 1959. All workers under 65 years of age who have registered with the Employment Exchange as available for work and who meet specified requirements with respect to previous employment and residence are eligible, provided their family income does not exceed a specified ceiling. An employee may lose his allowance if he refuses a job offer or is found to be an "excessive drinker." He may also be required to work on a government project in return for his unemployment allowance. Allowances may be paid up to a ceiling (which is rarely attained) of two-thirds of previous household earnings, exclusive of family benefits, and may continue indefinitely. In Paris a married worker receives 7.30 francs ($1.46) per day exclusive of family allowances for children. After 1 year, allowances are reduced by 10 percent every 12 months. However, this reduction may be suspended for certain regions or occupations in which there is a high level of unemployment.

Private unemployment insurance funds have existed in France since the 19th century. A 1958 collective agreement between the major employer and labor federations (made compulsory by a government order in January 1959) required all undertakings in the industries party to the agreement to pay 1 percent of payrolls into a contributory insurance fund (ASSEDIC), with employers paying 0.8 percent and workers 0.2 percent of wages. In January 1962, unemployment reserves were so large that the total contribution was reduced to 0.25 percent of wages—0.2 percent from employers and 0.05 percent from workers. The fund is administered jointly by labor and management and covers about 8 million workers. Eligibility requirements are the same as for unemployment allowances but there are no residence or need requirements. Benefit payments amount to at least 35 percent of daily average earnings during the previous 6 months, with a floor of 50 percent of the daily minimum wage set by law. Payments continue for 12 months and may be extended up to 20 months for those over 50, and until age 65 for workers who become unemployed at age 60 or over. The total of unemployment insurance and allowances (for those who meet the income test) may not exceed 80 percent of previous earnings, or 85 percent including dependents' allowances. Private plans may sometimes be used to supplement payments under the public and ASSEDIC programs.[17]

An employee is eligible for old-age benefits at age 60 regardless of whether or not he continues to work. A relatively small proportion take advantage of the opportunity to work and draw a pension simultaneously: In 1964 only 19 percent of male workers and 7 percent of women over 65 were working.[18] Maximum benefits of 20 percent of his annual wage during the last 10 years are paid to an individual who has worked 30 or more years. Past earnings are revalued for wage changes. He may receive 40 percent if unfit for work or if he has been engaged in "arduous work." An increment of 4 percent per year accrues to his pension if deferred until after age 60; thus at age 65 he would receive 40 percent of earnings, and 60 percent at age 70. Pensions at age 60 vary from a minimum of 800 francs ($160) to a maximum of 3,850 francs ($770) a year. Reduced pensions are payable at at rate of one-thirtieth of the full pension times years of insurance. A pensioner receives an additional 50 percent if he has a wife over 65, and a 10 percent bonus if he has raised at least three children.

Pensions are financed out of the general social security fund which also covers disability and death benefits, sickness, and maternity. Contributions total 20.25 percent of payrolls: The insured pays 6 percent of earnings, employers pay 14.25 percent of payrolls, and the government pays nothing.[19]

There is also a supplementary retirement system (UNIRS) which was established in 1957 that now has about 3.2 million members.

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[16] Meyers, *op. cit.*, pp. 69–70.

[17] ILO Draft, *op. cit.*

[18] *Yearbook of Labor Statistics, 1964*, International Labor Organization, table 3.

[19] *European Social Security Systems*, Paper No. 7, Joint Economic Committee, 80th Cong., 1st sess., U.S. Government Printing Office, Washington, 1965.

Government Manpower Programs

The Employment Exchange

Employers are required by law to notify the Employment Exchange of all vacancies, and unemployed workers must register to be eligible for unemployment allowances. Private profitmaking employment agencies, except licensed theatrical and domestic service agencies, are forbidden by law. Free employment agencies also exist and apparently play a rather important role. They are usually run by trade unions, mutual aid societies, or trade associations. There is general agreement that the National Employment Exchange is a relatively ineffective and inefficient organization which is rarely used by employers to fill vacancies, and is used by job seekers only as a last resort. It places about 400,000 per year, mostly in unskilled and semiskilled jobs. The Employment Exchange offices are "badly housed, insufficiently equipped and inadequately staffed".[20] In general the public Employment Exchange has proved to be a disappointment to both employers and trade unions.

In anticipation of a large influx of repatriates from Algeria, a Special National Employment Exchange was set up in Marseilles in 1962 because it was recognized that the regular Employment Exchange would not be able to handle the situation. In a few months 800,000 repatriates, including over 250,000 seeking work, flowed into France—far more than the anticipated 500,000, who were expected to return over a 3-year period. The skilled workers found jobs easily, but the others were harder to reintegrate into active life. There were enormous problems of training, retraining, and resettlement.

The Ministry of Labor embarked on an emergency operation to find jobs for the repatriates. By the end of November 1962, 90,000 vacancies had been compiled. But there was a wide divergence between the skills of the repatriates and the manpower needs of industry. The repatriates were often not eager to work, without even an elementary level of education, and without training or experience in industry. A system was worked out whereby "adaptation contracts" were made with employers similar to those used for the readaptation and retraining of handicapped workers. The contracts called for the repatriate to work part-time for pay, with the rest of his time devoted to training and adaptation provided by the employer and paid for by the government. The wage earner received a compensatory allowance for the training time during working hours.

By the end of 1962 many repatriates had been placed, but a large number were still registered as applicants for work. In spring 1963, the Ministry of Repatriation launched an operation known as "priority employment," using a variety of information techniques—booklets, notices to employers, press campaigns, radio and television, etc. A total of 62,500 jobs were reserved exclusively for repatriates. In April and May of 1963, 45,000 repatriates were resettled, and by December only 28,000 out of the 130,000 registered a year earlier were still without jobs. These too were eventually placed.[21]

The repatriation experience taught the authorities a great deal and pointed up the gross inadequacies of the regular Employment Exchange. So far not much has been done about putting into practice some of the lessons learned from the Algerian repatriation experience. While there are vast differences in the nature and extent of the problem and in the setting in which it occurred, the French repatriation measures, which proved so successful, might be worth studying in relation to the U.S. problem with nonwhite unemployment.

The Economic and Social Development Fund

The Economic and Social Development Fund (FDES) was set up in June 1955, to combine the activities formerly divided among three other funds for industrial reconversion, industrial decentralization, and manpower resettlement. Enterprises undergoing conversion or modernization are eligible for financial aid to cover expenses of retraining and also to pay trainees an allowance equal to the minimum wage during the time they are not productive. Laid-off workers who wish to move to accept new employment offered by the Employment Exchange, or those following an enterprise which decentralizes, are eligible for removal allowances to cover traveling expenses for themselves and their families, furniture shipment, and settling-in allowances of 2,000 to 3,000 francs ($400–$600) when housing is not provided by the firm.

The annual record of assistance granted under the FDES is shown in table 10. During 1955–62, 571 firms and 28,115 workers received financial assistance under the program; an additional 9,227 workers were trained in company programs during the first 8 months of 1963, after which all funds were blocked under the stabilization program instituted to check inflation. The average cost per trainee was 716 francs ($143). Removal grants, averaging 1,470 francs ($294), were given to 4,204 workers, including 790 during the first 8 months of 1963. More significant than the total figures is the steady increase in firms and workers benefiting

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[20] Vrillon, in *OECD Management Seminar*, *op. cit.*, p. 41; see also Lucas, in *OECD Trade Union Seminar*, *op. cit.*, pp. 14–17.

[21] Vrillon, in *OECD Management Seminar*, *op. cit.*, pp. 66–70.

TABLE 10. ASSISTANCE UNDER THE FRENCH ECONOMIC AND SOCIAL DEVELOPMENT FUND, 1955–63

Year	Number of firms	Training grants (francs)	Dollar equivalent	Wage earners trained	Removal applications granted	Removal allowances (francs)	Dollar equivalent
1955	7	110,000	(22,000)	132	289	430,000	(86,000)
1956	41	836,000	(167,200)	1,105			
1957	44	948,000	(189,600)	1,680			
1958	52	1,696,000	(339,200)	2,879	388	550,000	(110,000)
1959	68	1,437,000	(287,400)	2,385	338	540,000	(108,000)
1960	63	2,270,000	(454,000)	3,500	340	660,000	(132,000)
1961	119	4,348,000	(869,600)	6,417	862	900,000	(180,000)
1962	177	7,081,000	(1,416,200)	10,017	1,197	1,700,000	(340,000)
1963 [1]	NA	8,000,000	(1,600,000)	9,227	790	1,400,000	(280,000)
Total	571	26,726,000	(5,345,200)	37,342	4,204	6,180,000	(1,236,000)

[1] First 8 months only; all payments having been suspended after Sept. 12, 1963, when investment funds were blocked under the stabilization program.

SOURCE: 1955–62, from B. Vrillon, chapter on France, in *International Management Seminar on Active Manpower Policy: Supplement to the Final Report*, Brussels, Apr. 14–17, 1964, OECD Manpower and Social Affairs Directorate, pp. 57–58; 1963, from "Report of the Minister of Labor on the Application of the Regulation for Aid to Unemployed Workers and on the Development of Unemployment in 1963," Paris, 1964.

from the programs during each year since the FDES was instituted. Enterprises and workers benefiting most from the training grants in 1962 and 1963 were in the textile, electronics, and metal industries.

Firms are also eligible to receive special equipment bonuses to encourage industrial decentralization and the establishment of new industries in regions of actual or threatened unemployment. The bonuses amount to 8,500 to 11,000 francs ($1,700–$2,200) for each job created. Tax exemptions and special depreciation allowances are also available to such firms. In 1962, 39,000 jobs were created under regional expansion programs, and 249 Paris firms were decentralized resulting in creation of 30,000 jobs in the provinces.

The number of new jobs created as a result of the regional development policy are considered relatively small. Both employer and union representatives have criticized the complicated procedures which must be gone through before firms and workers can get help. A year to 18 months is said to elapse between the submission of an application for assistance and final payment of the funds granted. According to a spokesman of the French Confederation of Christian Workers, many workers try to get help from their unions or draw on their own resources to make necessary geographical and occupational adjustments rather than wait for government assistance to come through.[22]

National Employment Fund of 1963

The National Employment Fund of 1963 is the most recent of the measures taken by the French Government to help workers adjust to new job requirements caused by technological development. It provides for occupational conversion allowances to be paid to displaced workers who agree to take vocational training or retraining in skills which are in short supply.

In his speech to the French National Assembly in November 1963, in support of the Act to create the National Employment Fund, Minister of Labor Grandval said: "The day is past when each worker was able to expect to stay in the same place, the same enterprise, and even the same position during his entire career. The future condemns men, like nations, to change."[23] The quotation is strongly reminiscent of statements made in recent years by our own Secretary of Labor and serves to underscore the universality of the impact of technological change and the similarity of responses it evokes from responsible public officials.

In order to be eligible for assistance, workers must be unemployed and registered with the Employment Exchange, or they must be about to become unemployed due to a "collective dismissal." Occupational conversion allowances equal to 80 percent of average hourly wages during the preceding 3 months will be paid to workers taking training, with 90 percent being paid to those in training for occupations in urgent short supply.

Displaced workers who accept training or who are exempt from training because they already possess the requisite skills will receive certain benefits if they agree to move to designated areas where labor is in short supply: (1) a transfer premium varying with distance of the move and a reinstallation allowance according to family size and housing conditions; the total payment may not be less than 400 or more than 1,200 times the guaranteed minimum wage, with an absolute maximum allowances of 2,800 francs ($560); (2) travel indemnity for the worker and his family; (3) a fixed sum to cover the cost of moving furniture.[24]

The Minister of Labor is authorized to take special measures to promote retraining and reemployment in certain regions and in specified occupations. These include the making of cooperative agreements with professional associations, unions, or private undertakings to develop necessary manpower adjustment programs. These agreements may, in the case of collective dismissals, provide payments to workers deemed to be unsuitable for retraining, who accept jobs paying 60 percent or more below their former earnings, to bring their wages up to 90 percent of former earnings during the first 6 months of such employment, and to 75 percent for the next 6 months. Workers over 60, who are not suitable for retraining, are also eligible to receive special payments until they attain age 65.

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[22] *Ibid.*, also see Lucas, in *OECD Trade Union Seminar, op. cit.*

[23] Press release, Minstry of Labor, Paris (undated); the Minister of Labor of West Germany, Hans Katzer, made a very similar statement in an interview in the *Kolnischen Rundschau*, Oct. 27, 1965.

[24] "Fonds National De L'Emploi," Ministere Du Travail, Textes Officials, Serie A: Travail Et Emploi, No. 5, Paris, Feb. 15, 1965. 1965.

An example of the way the National Employment Fund may be used is furnished by the St. Nazaire and Nantes Naval Construction Yards case. There, 700 workers were retrained under the fund. Only 10 applied for removal to a new locality. Agreements were signed with 12 undertakings to provide special payments to workers over 60 and to others transferred to jobs paying less than they had previously earned. Six special agreements were also signed for retraining redundant workers. Private firms agreed to provide retraining facilities, and the fund paid for support, supplies, instructors, and training allowances.[25]

It is evident from the small appropriation provided for the National Employment Fund—24 million francs ($4.8 million) in 1964—that financial support will have to come mainly from other sources. A portion of the cost may be met from the European Social Fund (see next section). But the source most often mentioned is the joint labor-management Unemployment Insurance Fund. This has caused concern to the organizations responsible for administering this fund that decisions may be taken regarding its reserves without consulting them. Express assurances have been given by the Minister of Labor that this would not happen.

The first annual report covering the operations of the National Employment Fund in 1964 showed a rather limited accomplishment. Of the 24 million francs ($4.8 million) appropriated, 10 million ($2 million) were withdrawn to be applied to reinstallation and occupational reclassification allowances, and 1.2 million francs ($240,000) for vocational training of adults under the auspices of the Ministry of Labor. Only 577,000 francs ($115,400) were shown as actually spent by the fund for conversions, transfer payments, training agreements, and special allocations.[26] Since the Act was not passed until December 18, 1963, the year 1964 cannot provide a reliable indication as to its future effectiveness. However, it will need to have substantially more money at its disposal if it is to begin to do the job for which it was intended.

European Social Fund

The European Social Fund was set up under the Treaty of Rome, which established the European Economic Community in 1957, to promote geographical and occupational mobility of workers within the community. It provides for reimbursement of 50 percent of the costs incurred by member countries in vocational training, resettlement, and payments to maintain income of workers made unemployed by industrial reconversion. In order to be eligible for assistance, workers must have been in productive employment for at least 6 months within the year following retraining or resettlement. Underemployed workers seeking other employment are also covered.

The fund is financed by member states according to the following scale of contributions: Federal Republic of Germany and France, 32 percent each; Italy, 20 percent; Belgium, 8.8 percent; the Netherlands, 7 percent; and Luxembourg, 0.2 percent. Reimbursements awarded up to the end of 1962 totaled 12.3 million "units of account" (roughly equivalent to dollars) divided as follows: France, $4,624,641; Italy, $3,733,198; West Germany, $1,999,912; the Netherlands, $1,472,626; and Belgium, $461,421. Some 183,000 unemployed workers received assistance, of whom 103,000 were retrained and 79,200 resettled. Retrained workers were divided as follows: France, 9,700; Italy, 69,000; West Germany, 19,700; Netherlands, 3,500; and Belgium, 1,400. All the resettled workers came from Italy, with 48,000 taking up employment in France, 2,700 in West Germany, and 4,000 in the Benelux countries, mostly in Luxembourg. At the end of 1962 applications awaiting decision for reimbursement totaled $20 million, with most of the applications relating to operations conducted in 1960 and 1961.[27]

The fund has had considerable influence on policies of member countries. The fact that payments are available for retraining, resettlements, and income maintenance on a 50–50 sharing basis between a member country and the fund has encouraged the adoption of policies providing such payments in individual countries. It has also served to gear these policies, to some extent, to the particular provisions governing payments through the fund.[28]

Proposals are presently under discussion to expand the scope of the fund to cover retraining for new techniques and changing manpower requirements of industry, to finance retraining centers and differential wages for workers in declining or poorly developed regions where new industries are established, and to aid in the construction of housing for migrant workers.

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[25] ILO Draft, *op. cit.*

[26] "Bilan Des Activités Du Fonds National De L'Emploi au Cours De L'Année 1964," Ministère Du Travail, Paris, Feb. 16, 1965.

[27] J. Dedieu, "European Economic Community," in *OECD Trade Union Seminar, op. cit.*, pp. 93–107.

[28] Letter from M. S. Gordon, Dec. 6, 1965.

The European Coal and Steel Community

The European Coal and Steel Community (ECSC) is authorized to give financial assistance to member states when the introduction of new technology or equipment reduces manpower requirements in the iron and steel and coal industries, entailing special difficulties in the redeployment of displaced labor. It can also help in situations where the establishment of the Common Market obliges undertakings to cease or change their activities with adverse effects upon workers.

The ECSC can provide financial assistance for: (1) Allowances to unemployed workers waiting to be reemployed; (2) differential allowances to workers accepting lower paid jobs; (3) reinstallation indemnities to cover expenses of removal and resettlement of workers who move in order to accept new employment; and (4) retraining workers obliged to change occupations.

The level and duration of payments and the contribution of the ECSC varies with the legislation and the economic situation in each country or region. These are fixed by negotiation between the High Authority of the Community and the government concerned, which must pay at least 50 percent of the cost involved and take responsibility for carrying out agreed upon measures. The ECSC may also conduct studies regarding the potential for new industries in areas where large numbers of coal and steel workers are threatened with dismissal, and contribute financially toward the establishment of new plants to provide employment for displaced workers.

Between March 1960 and January 1964, the ECSC contributed $4,182,000 to aid in the readaptation and reemployment of 8,073 workers in the coal and iron and steel industries of France: 4,527 were coal miners, 1,904 iron miners, and 1,642 steel workers.[29] A few examples of assistance given by the ECSC follow.

An agreement was reached with a steel company to assist some 1,500 workers affected by the closing of a steel plant in Le Bouceau in 1962. Financial assistance and special inducements were offered to firms to establish operations in the region. The steel company kept its plant open during the transition period to provide employment to workers and arranged to transfer them to the new plants as they were constructed. The task was made particularly difficult because of the high average age and specialized skills of the workers involved. Financial and technical assistance were given for retraining.

In the Centre-Midi region an agreement was signed in 1962 between the government, the state coal company, and the unions after a long strike at Decazeville. It provided for the extension of the period (from 1 to 2 years) during which payment would be given for retraining and for differential allowances to displaced miners. They were guaranteed 90 percent of their former earnings. Measures were taken to assist older workers, the physically handicapped, and individuals who wished to set up small businesses; also provided were scholarships and help in finding employment for miners' children.[30]

Training for People Not in Labor Force

Education and training for students is conducted under the Ministry of Education, which fixes the program of study and organizes the official examinations for diplomas. This makes for considerable uniformity in the curriculum of all schools.

In 1959 reforms were instituted to relieve congestion in the lycées, which prepare students for the university, and to orient pupils not adapted to this type of studies to more practical and technical education to fill the need for skilled labor and qualified technical and scientific personnel. The program introduced an "observation cycle" during the first 2 years of secondary school during which students may move from one section to another. At the end of the 2-year cycle, when pupils are 13 or 14 years old, a definite choice is made to enter into general, technical, or vocational education. Also introduced in 1959 was the "technical baccalaureate" leading to schools of engineering and science.

The Fourth Plan provided for six new schools for engineering training, an increase in the number of schools for applied sciences, and enlargement of university facilities. A special degree in applied science was created. The objective was to double the capacity for training engineers between 1960 and 1965 and to increase the number of technicians trained from 6,000 in 1961 to 20,000 in 1967. As of 1965, it appears that these targets were not being met. [31]

This concern over the supply of engineers is particularly significant because France has always been in the forefront of West European countries in the training of engineers. In 1955, France had 92,000 university-trained engineers, or 6.6 engineers per thousand nonagricultural employees; West Germany had 4.1 per thousand; Sweden 4.6; the United Kingdom 3.9 (in 1959); and the United States 11.5. In Europe, only France and Norway came close to the Communist countries in the number of engineers in relation to the nonagricultural labor force.[32]

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[29] F. Vinck, "Industrial Conversion in the European Coal and Steel Community," *International Labor Review*, June 1965, pp. 489–502.

[30] ILO Draft, *op. cit.*

[31] *Ibid.*

Compulsory schooling in France, which ends at age 14, is to be raised to 16 in 1967. Students who leave school at 14 follow one of the following avenues of vocational training: (1) 2 years in a primary school, taking courses in general education and learning the rudiments of a trade in industry or being trained for work in an office, (2) full-time vocational training in a technical college; (3) apprenticeship training in an artisan or industrial trade; and (4) full-time training in a work school of a large industrial undertaking.

The technical colleges, of which there are about 900 with 200,000 students, give training to meet the needs of the region where they are located. Their purpose is to train semiskilled and skilled workers with a broad educational background which will enable them to adapt better to rapid technical change. After 3 years a student may qualify by public examination for a "certificate of professional aptitude" (CAP), which gives him status as a skilled worker. Students in works schools or in apprenticeship may also take this examination. The CAP certificate is not essential but it gives a worker more security of employment and a better chance for promotion. Workers with the CAP may qualify after 2 or 3 years of experience and further special training for a "professional diploma" giving them access to more highly qualified jobs, including foremen.

Trainees who take a 4-year course in a technical college may obtain by examination, after some time in industry, a certificate as a "technical agent" permitting them to apply for highly skilled jobs. This is considered equivalent to 5 years of secondary education and may lead to supervisory jobs. Higher technicians are trained in special schools whose trainees are recruited from graduates of both technical and general colleges. A diploma as a higher technician in a special field is equivalent to the baccalaureate.[33]

In all of the above programs an attempt is being made to foresee manpower needs 10 to 15 years ahead and to train students for them.

Training for People in the Labor Force

Students taking courses in public and private vocational schools usually also receive training in industrial establishments when they enter the labor force. A large number, however, still learn a trade through apprenticeship, with complementary classroom instruction in theoretical aspects at a special school. The terms and conditions of apprenticeship are fixed by law and also regulated by collective agreements. A 1963 circular specifies the length of training, obligations of the parties, remuneration, conditions of work, and health and safety measures. Instructors in apprenticeship programs are selected carefully and given special training. Upon completion of the apprenticeship period, usually about 3 years, trainees are eligible to take the CAP or artisan examination.

In 1961, there were 686,000 apprentices broken down as follows: 238,000 in public establishments, 172,000 in industry establishments or workshops, 110,000 educated by religious bodies or otherwise, and 166,000 in handicraft industries. About 40 percent of all skilled workers are trained part time by apprenticeship on the job, accompanied by vocational training courses; 60 percent are trained full time in public technical schools (36 percent), in private schools (18 percent), and in occupational or firm schools (6 percent). The cost of training an apprentice in a firm school is relatively high, but trainees from such schools have a higher percentage of successful candidates among those taking the CAP examination upon completion of training.[34]

Apprenticeship training is essentially based on artisan-type trades and skilled and semiskilled occupations in factories. Some people question whether this type of training is well suited for modern industry, which is increasingly using automated processes and advanced technology. They believe that more emphasis needs to be put on theoretical technical training. The same kind of doubts also exist in West Germany and other countries where apprenticeship training is an important part of the total training program for industry.

The following criticisms have been made of apprenticeship training by an employer representative:

1. Excessive use of classroom instruction;
2. State training induces a psychological maladjustment to the technical rhythm of industrial production and a dislike of manual labor;
3. Vocational training on the job does not give apprentices a high enough standard of technical knowledge;
4. It is only possible to provide apprentices with modern and varied tools in the firm and particularly in large firms.[35]

He suggests that consideration be given to fixing a compulsory percentage of apprentices for each firm in proportion to the number of its trained workers, and that apprenticeship on the job be progressively replaced by apprenticeship in firms or interfirm centers. This, he suggests, may result in training more appropriate to the needs of firms and thus would help solve the skilled labor problem.

The government's most important program for training unemployed and employed workers is the accelerated Vocational Training for Adults Program (AVT). It was organized in 1939 to train rapidly workers needed in war production. After the war it was based on the need for reconstruction and was quickly extended to include the metallurgical trades. In 1949, the National Association for the Rational Training of Manpower for all Occupations (ANIFRMO) was created and paved the way for expanding adult vocational training in terms of both the number and variety of programs. ANIFRMO is under tripartite management and has considerable autonomy. Its major activities are:

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[32] *Some Factors in Economic Growth in Europe During the 1950's*, *op. cit.*, ch. V, p. 14.

[33] ILO Draft, *op. cit.*

[34] Vrillon, in *OECD Management Seminar*, *op. cit.*, pp. 50–52.

[35] *Ibid.*

1. Direct control of more than 100 centers, with an annual intake capacity of 50,000 trainees in 1965, to be expanded to 75,000 under proposals in the Fifth Plan.
2. Supervision of private centers created by firms or trade organizations which can be approved and subsidized, provided they adhere to ANIFRMO standards.

ANIFRMO also runs the Institute of Vocational Training, whose principal function is to train instructors and technical supervisors and draw up training syllabuses; and the Center of Psychotechnical Study and Research (CERD),[36] which constructs tests to be used in selection of instructors and trainees.

The AVT programs have had a strong bias for training in the building and metalworking trades, but the centers are becoming more diversified and now give courses in 160 trades. In 1963, 25,834 of the 31,336 receiving training were in these two fields. Workers must be at least 18 years old to be eligible for training; the upper age limit has recently been raised from 35 to 40. Applicants undergo a rigorous selection process, including medical and aptitude tests, both written and oral. Trainees are put into sections of about 15 each, and may enter the program at any time since the instruction is heavily adapted to individual needs. Courses last 3 to 6 months for 40 hours a week, divided among practical work (33 hours), technical design (5 hours), and classroom instruction (2 hours).

In the more advanced second degree centers, the minimum age is 21 and higher educational qualifications are required, although a 3-month course in mathematics is sometimes given to enable applicants to qualify. These courses last 9 to 11 months, and in 1963 were given to 2,203 trainees.

AVT training is free. Trainees receive allowances equal to the minimum guaranteed wage in the region plus family allowances and unemployment insurance coverage. Second degree trainees receive supplemental bonuses to bring their allowances up to 80 percent of former earnings. All trainees receive free housing and travel expenses but pay for meals taken in the center canteen.

Despite what appear to be rather generous training allowances as compared with other countries, they are still apparently not high enough to attract older and established workers with families. The great majority of trainees are young, single men. Manpower offices often refer workers for training even when they can find unskilled work.

Retraining activities are financed from a variety of sources: Ministry of Labor, Economic and Social Development Fund, National Employment Fund, European Social Fund, and the European Coal and Steel Community. Employers are also subject, since 1925, to an apprenticeship tax which currently amounts to 0.4 percent of the annual wage bill. Firms which directly or indirectly contribute to vocational training are exempt from this tax. Proceeds of the tax go into the state budget allowance for technical and vocational training and apprenticeship. But direct costs of apprenticeship centers in the undertaking, including salaries and remuneration of apprentices, may be deducted as may indirect expenses, such as contributions to a public or private training institution. An employer representative has complained that as a result of the way that exemptions are granted, only about two-thirds of the total tax intake is available for training. The rest is used up in administrative expenses.[37]

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[36] V. Martin, *Accelerated Vocational Training for Adults*, OECD, Paris, 1965, pp. 15–16.

[37] Vrillon, in *OECD Management Seminar, op. cit.*, p. 52.

Chapter 4. West Germany

Both in terms of self-image and as seen by other nations, West Germany probably leads the Common Market countries and all West Europe in technological development. German industry is respected for what it has already accomplished and for what it is expected to accomplish in the future. Only Sweden is ever mentioned in the same breath, but the difference in size, industrial diversification, and geography make direct comparison difficult. The United States is acknowledged by German industrialists and trade union officials to be technologically in advance of West Germany, but even so they point to specific industries and firms which are considered ahead of their counterparts in the United States; e.g., Volkswagen in automobile production, Balsan in food products, and the railroad industry in general.

Factors Influencing Technological Development

In chapter 1 we pointed out that in 1960 and 1961 West Germany was the largest user of computers in Western Europe, though a few countries had more computers installed in relation to their nonagricultural labor force. The German Metalworkers' Union has published statistics compiled by John Diebold and Associates (see table 11), which show that as of January 1, 1964, West Germany had widened its lead over other countries in number of computers installed. Projections to 1974 are also given in table 11.

TABLE 11. COMPUTERS INSTALLED, 1959 AND 1964, AND FORECAST FOR 1965, 1968, AND 1974 (AS OF JANUARY 1)

Country	1959	1964	1965	1968	1974
West Germany	94	1,019	[1] 1,363	3,239	6,243
France	20	681	900	1,655	3,600
United Kingdom	110	670	880	2,019	5,473
Netherlands	15	164	221	433	590
Italy	16	432	612	1,143	1,807
Belgium	10	152	206	350	451

[1] A recent revision estimates that West Germany will have about 2,600 computers installed by the beginning of 1966. (Letter from G. Friedrichs of the Metalworkers' Union, Nov. 22, 1965.)

SOURCE: "Automation, Rationalization, Technical Progress," Automation Conference, Mar. 16–19, 1965, the Metalworkers' Union of the Federal Republic of Germany, with figures furnished by John Diebold & Associates.

It is interesting to note that on the basis of the figures in table 11, the percentage increase in the number of computers installed in West Germany between 1959 and 1964 was less than in France and Italy. Of course, France and Italy started from a much lower base. The anticipated increase from 1964 to 1974 was larger for the United Kingdom than for any of the other countries in West Europe. However, according to the forecast, West Germany will continue to lead all other countries in the use of computers.

The Metalworkers have expressed concern over the rapid acceleration of automation in West Germany. They have tried, with little success, to arouse other unions and the government to the need for measures to protect workers against the potentially harmful social effects of rapidly changing technology. A quite different attitude is taken by the Railway Workers' Union, whose leadership professed no concern over technical innovations in German rail transport, many of which are laborsaving in nature. These include such developments as:

(1) Machines which have replaced maintenance and manual workers, resulting in a 50-percent reduction in employment.

(2) The equipment of all rolling stock with ball bearings, permitting larger carriages and resulting in fewer maintenance problems.

(3) Electrification of locomotives and elimination of firemen, not only on freight trains but also on passenger trains. Each diesel is manned by an engineer and a mechanic. The "dead man's knob" is used as a safety device which will stop the train if continuous pressure is not applied by the engineer.

(4) Widespread use of mechanical loading and special carriages, designed for rapid loading.

(5) Remote control of trains on runs of over 100 kilometers, which is still in the introductory stage. These trains will travel at a speed of 200 km. per hour and will be controlled in an operations center where a central panel will show the position of all trains. Union officials admitted that technically engineers would not be required on such trains, but they expected they would continue to be used for "psychological" reasons.

The lack of concern, indeed the pride, among union officials over these laborsaving technological developments may be explained by the fact that the union has been successful in negotiating very generous provisions for workers affected by technological change with the government-owned railroads.

German management is less oriented toward engineers and technically trained men than the French. The board of directors of a large company usually includes not only engineers and/or natural scientists, but also lawyers and applied economics graduates. Less emphasis is put on a university education than in France, though probably more than in the United Kingdom. Germany industrial management, except in steel and heavy engineering, is also much more socially mobile than in France. Industrial management has very high prestige and status as contrasted with other elite occupations, and business is in a strong position to compete for the services of the best young men.

Most basic to German management is the sharp distinction between the entrepreneur (Unternehmer) and the manager. Top echelon executives reach the entrepreneur level very young, frequently through movement between firms: "The man who holds a middle management position for long thereby proves conclusively that he is not an 'entrepreneur' type." According to Granick, this "rather mystical feeling of 'entrepreneurship,' of a 'calling' and of loyalty to private enterprise . . . is valued most decisively" in West Germany.[1]

Government, industry, and trade union representatives are aware of no major factors which might be expected to limit technological advance in Germany. On the contrary, there is a universal expectation that automation and technological development will proceed at an even more rapid pace than in the past. Only in industries where large-scale production is a prerequisite to automation is technological advance likely to lag. The relatively high price of capital is also mentioned as a possible deterrent to investment in automation. On the other hand, such factors as a slowly growing labor force, expected increases in military requirements, little immigration which dried up with the erection of the Wall in 1961, reduction of the workweek, and difficulties and costs involved in recruiting and assimilating foreign workers serve as important inducements to introduce laborsaving devices and automation.

Changes in Employment Structure

We noted earlier that West Germany had an extraordinary rate of growth and productivity increases in the 1950's, and that this record continued into the early 1960's, though at a somewhat reduced rate. We have also pointed out the large increases in employment in the industrial and service sectors of the economy which have benefited from the exodus from both agriculture and East Germany before 1961. A detailed examination of employment data in various industrial branches indicates that West Germany has been going through a significant change in its employment structure, both as regards total employment and the division between production and white-collar workers.

Table 12, prepared by the German Metalworkers' Union, shows employment, production, and productivity changes during the period 1958–63 in 21 industries in which production-worker employment has decreased. Also shown are total figures for 42 industries employing about 8 million people. Despite the fact that total employment increased by over 530,000, or 6.9 percent, 17 industries experienced employment decreases of about 330,000 workers. (During the period 1951–56 only five industries had employment decreases.) More significantly, white-collar employees increased by 27 percent, while production workers rose only 2.4 percent. All 21 industries experienced decreases in production worker employment. White-collar employment, on the other hand, increased in all but 4 industries, including 13 in which total employment declined. In 1963, white-collar employees represented 21.3 percent of total employment. (In the United States nonproduction workers in manufacturing were 26 percent of the total in 1963; the 21-percent figure was reached in the United States in 1955.[2]) Total output in all 42 industries went up by 35 percent, and output per man-hour rose by more than 40 percent. Production increased substantially in almost all industries, including 12 in which total employment declined.

The coal mining industry showed by far the largest decrease in employment—182,426, or 28.4 percent—with output being held almost constant while productivity rose by 48 percent. Textiles showed the next largest absolute decrease—52,639, or 8.4 percent—while output rose by 15 percent and productivity by 38 percent. Despite the large drop in total employment, white-collar employees in textiles actually increased by 7.5 percent. Other industries with significant employment decreases were woodworking, tobacco, and iron mining. Largest percentage increases in employment were registered in the following industries (not shown in table): plastics (60 percent), vehicle building (36 percent), rubber and asbestos (20 percent), papermaking (22 percent), and electronics (26 percent).

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[1] D. Granick, "Management in European Heavy Industry," *Steel Review*, October 1962, pp. 23–29.

[2] *Manpower Report of the President*, 1965.

TABLE 12. CHANGES IN PRODUCTION, PRODUCTIVITY, AND EMPLOYMENT IN 21 INDUSTRY BRANCHES AND IN INDUSTRY AS A WHOLE, 1958–63, WEST GERMANY, EXCLUDING WEST BERLIN AND THE SAAR

Industry branch	Production (percent)	Output per man-hour (percent)	Production Workers		White-collar employment		Total employment	
			(percent)	(number)	(percent)	(number)	(percent)	(number)
Petroleum processing	+143.1	+156.9	−0.1	−26	+40.9	+2,976	+10.5	+2,950
Fine machinery and optics	+32.6	+46.6	−1.3	−1,513	+25.6	+6,996	+3.7	+5,483
Iron and steel treating	+10.0	+18.1	−1.0	−1,166	+17.9	+3,430	+1.7	+2,264
Leather	+24.9	+39.7	−1.8	−628	+12.1	+765	+.3	+137
Paper and pulp	+23.4	+33.1	−2.8	−1,974	+12.9	+1,494	−.6	−480
Sawmills and lumber	+13.7	+24.3	−3.7	−2,643	+7.3	+985	−2.0	−1,658
Wire and cold rolled works	+10.9	+25.5	−5.4	−3,301	+14.0	+1,579	−2.4	−1,722
Musical instruments and toys	+26.9	+48.8	−6.0	−3,071	+15.3	+1,422	−2.7	−1,649
Woodworking	+26.8	+47.4	−7.8	−15,346	+14.3	+4,498	−4.7	−10,848
Shoes	+21.9	+40.6	−7.1	−6,717	+6.4	+799	−5.5	−5,918
Milling	−7.4	+11.9	−12.6	−1,446	+2.5	+118	−8.2	−1,328
Textiles	+15.1	+38.1	−11.1	−59,404	+7.5	+6,765	−8.4	−52,639
Sugar	+12.4	+37.4	−11.4	−1,700	+6.3	+151	−8.9	−1,549
Potash and stone and salt mining	+17.5	+47.7	−12.5	−2,582	+11.4	+339	−9.5	−2,243
Fine ceramics	+10.4	+38.0	−13.6	−11,215	+14.6	+1,679	−10.1	−9,536
Petroleum extraction	+73.1	+152.5	−28.0	−2,695	+22.7	+771	−14.8	−1,924
Leather products	−9.4	+24.5	−23.4	−7,624	−2.8	−140	−20.6	−7,764
Coal mining	−.6	+47.9	−30.6	−178,723	−6.3	−3,703	−28.4	−182,426
Other mining	−.7	+48.1	−31.2	−4,868	−15.1	−251	−29.6	−5,119
Tobacco	+34.9	+131.9	−36.7	−21,613	+2.8	+202	−32.4	−21,411
Iron mining	−26.7	+65.0	−52.0	−10,994	−37.2	−950	−50.4	−11,944
Total				−339,249		+29,925		−309,324
Combined industries (42)	+34.7	+40.6	+2.4	+152,972	+27.2	+377,227	+6.9	+530,199

SOURCE: "Automation, Rationalization, Technical Progress," Automation Conference, Mar. 16–19, 1965, the Metalworkers' Union of the Federal Republic of Germany. Table compiled by Metalworkers' Union, Automation and Nuclear Energy Division, from statistical data from the German Institute for Scientific Progress, Berlin.

Some may interpret the figures in table 12 as showing the continuing strength in employment in the industrial sector, emphasizing the total increases in employment, production, and productivity. The German Metalworkers' Union, however, has expressed considerable concern over the fact that production-worker employment decreased in 21 industries, and that output was maintained in coal mining and increased in textiles despite sharply declining employment in both industries. Coal mining shows "the typical effects of mechanization and automation in a stagnant industry," according to the Metalworkers' analysis.[3] It further notes that industrial employment reached its peak in 1961 and "stagnated" thereafter, despite continued increase in output. Table 13, prepared by the union, shows that production worker employment declined by 193,474 workers (2.9 percent) between 1961 and 1964. Salaried employees have continued to increase in number, by 163,695 (10 percent), but not enough to keep total employment from going down by about 30,000 (0.4 percent) during the period. The decrease in produc-

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[3] "Automation, Rationalization, Technical Progress," Automation Conference, Mar. 16–19, 1965, the Metalworkers' Union of the Federal Republic of Germany, p. 33 (trans.) ; the Ministry of Labor ascribes the decline in coal mining employment more to the closing down of uneconomical operations than to mechanization or automation.

TABLE 13. PRODUCTION, LABOR PRODUCTIVITY, HOURS OF WORK, NUMBER OF EMPLOYEES, HOURLY AND SALARIED, IN GERMAN INDUSTRIES[1] (INCLUDING WEST BERLIN AND THE SAAR) 1960–64[2]

	1960	1961	1962	1963	1964	Relative change in percent		Absolute changes	
						1961–64	1962–64	1961–64	1962–64
Net output in 1958 prices 1958=100	120.3	126.6	131.4	134.7	145.7				
Annual rate of change in percent	+11.9	+5.3	+3.8	+2.5	+8.2	+15.1	+10.9		
Labor productivity (net output per production worker man-hours worked); 1958=100	117.9	124.0	132.7	140.6	152.4				
Annual rate of change in percent	+8.4	+5.2	+7.1	+5.9	+8.4	+22.9	+14.8		
Production workers	6,545,371	6,674,079	6,622,814	6,501,404	6,480,605			−193,474	−142,209
Annual rate of change in percent	+3.6	+2.0	−0.8	−1.8	−0.3	−2.9	−2.1		
Salaried employees	1,535,547	1,641,420	1,716,415	1,762,711	1,805,115			+163,695	+88,700
Annual rate of change in percent	+6.3	+6.9	+4.6	+2.7	+2.4	+10.0	+5.2		
Total employment	8,080,918	8,315,499	8,339,229	8,264,115	8,285,720			−29,779	−53,509
Annual rate of change in percent	+4.1	+2.9	+0.3	−0.9	+0.3	−0.4	−0.6		
Annual hours of work per production worker	2,046	2,008	1,963	1,935	1,937				
Annual rate of change in percent	−0.2	−1.9	−2.2	−1.4	+0.1	−3.5	−1.3		

[1] Excluding construction and electric power.
[2] 1964 preliminary.

SOURCE: Compiled by the secretariat of the Metalworkers' Union, Automation and Nuclear Energy Division, from statistical data from the German Institute for Economic Research, on the basis of the census of manufacturers of the statistical office of the Federal Republic.

tion worker employment was accompanied by an increase in man-hour productivity of 22.9 percent, with the result that output rose by 15.1 percent for the 1961–64 period, even though total hours worked declined by 3.5 percent. The Metalworkers fear that technical progress, unless accompanied by substantial economic growth and reduced hours of work, may result in a continuing decline in employment in many branches of industry and eventually in the industrial sector as a whole. “This development is a result of automation and other forms of technical progress,” say the Metalworkers, and they ask: “Will industrial employment in Germany decline in the future as it has in the United States?”[4]

This view is not shared by most employer and government representatives, nor even by many other unions in West Germany which have exhibited little concern over the impact of automation. It represents, in large part, the thinking of Dr. Günther Friedrichs, energetic and forceful director of the automation and nuclear energy division of the Metalworkers' Union. Even within his own union, there are those who dispute Dr. Friedrichs' conclusions regarding the problems that automation may bring to the German economy.

Others tend to regard manpower shortages as the major problem to be dealt with. The government hopes to meet overall manpower needs by increasing the number of foreign workers, who already number over 1 million; by encouraging older workers to defer retirement at age 65 and continuing to work at least part time; by attracting more women, especially married women, into the labor market; and by increasing overtime work if necessary. The extent of the shortage is impossible to estimate, but as of September 30, 1965, some 700,000 job vacancies were registered with the Employment Exchange as compared with 85,000 registered unemployed, many of whom are considered unemployable.

Friedrichs disputes the view that Germany has a manpower shortage. He argues that if there were a real need for workers more overtime would be worked. During the 1-year period April 1964–65, overtime averaged 2.8 hours over and above the average negotiated workweek of 41.5 hours—the difference being paid at premium rates of 25 percent and 50 percent on Sunday.[5] Friedrichs considers the large number of vacancies reported to the Employment Exchange as not being a valid indication of requirements, since employers tend to exaggerate their needs. On the other hand, the Labor Ministry notes that many employers do not report all job vacancies, preferring to fill some openings through other sources or because they have no hope of obtaining the necessary workers through the Employment Exchange.

Friedrichs feels even more strongly about the issue of whether or not West Germany has a shortage of skilled workers. He believes that the country has a surplus of skilled workers, many with training in the wrong skills and many others being used below their skill capacity. Contrary to the prevailing view in the United States and elsewhere that automation increases the need for skilled workers, Friedrichs contends just the opposite: Automation is more often deskilling in nature and makes it possible to carry on operations with a lower proportion of skilled workers than formerly. He supports this contention with figures showing the following changes in skill composition of employment in the German metal industry employing about 4 million workers.[6]

Workers	Percent	
	1951	1963
Skilled	50.05	41.58
Semiskilled	32.16	40.11
Unskilled	17.79	18.31
	100.00	100.00

He expects the proportion of skilled workers to decrease even more as automation becomes more widespread in German industry.[7]

A study conducted by the German Institute for Economic Research (IFO) tends to support the view that automation, at least in the early stages which are most prevalent in Germany, is likely to reduce skilled-worker requirements in favor of semiskilled workers. In a study of about 30 firms in some 20 industries which had introduced automation, IFO found that in most cases practical and theoretical skill requirements were lower than before. There were increased demands for highly skilled machinists, engineers, and technicians, but these were more than countered by the reduction in skill required in many production jobs. Government and employer spokesmen, while less certain about the effect of automation on skill requirements, tended to go along with the view that advanced technology often resulted in more routine jobs at the same time that it increased the need for a higher proportion of white-collar employees, technicians, and maintenance men. A representative of the Textile Workers' Union also subscribed to the view that the newer mills with modern equipment needed fewer skilled workers than older textile factories. The textile industry lost 100,000 production workers between 1952 and 1964, while white-collar employees actually increased.

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[4] *Ibid.*, p. 3.

[5] Letter from V. Ulriksson, U.S. Labor Attaché, Bonn, Nov. 23, 1965.

[6] "Automation, Rationalization, Technical Progress," *op. cit.*, p. 34.

[7] In a Nov. 22, 1965, letter, Friedrichs qualifies this view as follows: "The percentage of skilled workers will increase again in some years from now, when we reach the stage where maintenance work starts to dominate. But I doubt that this will increase the absolute figures of skilled workers."

The large number of industries undergoing changes in both the level and structure of employment calls for a high degree of occupational mobility on the part of workers. Technological change has resulted in a great deal of labor displacement but very little unemployment. The Metalworkers' Union estimates that 1.5 million workers are displaced each year. The Labor Ministry considers this estimate to be an exaggeration. Most often workers displaced from jobs in one department or plant are transferred to other jobs in the same plant or to another operation of the same company. The IFO study mentioned above found that 7 percent of the workers in the companies studied were displaced but were absorbed within the same company. Only two companies in the IFO study actually dismissed workers as a result of changed technology, and these found other jobs very quickly. Retraining, when necessary, was done by the firms themselves. Some people had to take lower rated jobs, often at lower pay. Others refused to accept retraining and preferred to take a wage cut; this was especially true of older workers. We were also told that many displaced older workers leave the labor force for early retirement.

There are conflicting views regarding the effect of the apprenticeship system on labor mobility in Germany. There are those who argue that apprenticeship is so widespread and provides such good basic training in fundamentals that German workers adapt easily to new jobs when they are required to do so as a result of technological change. Often cited as an example to support this view is the way coal miners in Bochum were absorbed into a new automobile plant producing the Opel GM car, which started operations in the area shortly after the mines closed. We were told that only a short period of retraining was necessary for these men. In fact, many miners started leaving as soon as they learned that the mines were to shut down some months later, and employers had to offer a bonus to induce miners to stay as long as needed.

Others argue that apprenticeship training is so highly specialized in a particular trade that German workers tend to become relatively immobile and have great difficulty adjusting to new jobs. The psychological adjustment may be even more difficult than the physical one because of the high value placed upon working in the trade for which one is trained. To give up his apprenticed trade represents a tremendous psychological wrench for the German worker. The fact that he often must start at the bottom of the ladder in his "new" trade, perhaps at lower pay, or commute some distance to his new job, makes the adjustment more difficult. Nonetheless the low rate of unemployment, despite considerable labor displacement, indicates that German workers are changing jobs even if they are not particularly happy about it.

Collective Bargaining

Trade unions in West Germany have made considerable wage gains in recent years. Wages have gone up about 70 percent since 1958, while the cost of living has increased by only 16 percent, resulting in a substantial rise in the standard of living of German workers. Labor Ministry representatives consider German wages to be about on a par with those in Great Britain, higher than in other Common Market countries, but below Sweden. Social benefits provided by government are also relatively high in West Germany. In 1962 government social security expenditures were 14.4 percent of national income in West Germany, which was higher than in any other West European country and three times as high as in the United States.[8]

Unions have been placing increasing emphasis on measures designed to protect workers against the hazards of technological change. Agreements have included provisions extending protection already afforded by law in such areas as dismissal notice, advance consultation, unemployment compensation, pensions, and retraining. In addition unions have been demanding increased vacation benefits, reduction in weekly hours, severance pay, and extension of codetermination. Collective bargaining is conducted on an industry basis in West Germany, and provisions to deal with problems of automation and technological change vary from one industry to another.

The railroad industry, which is government owned and operated, has negotiated some of the most comprehensive provisions on wage and job security with the German Railwaymen's Union. Since 1958, 68,000 railroad workers have been displaced but, according to the union, none became unemployed. This is ascribed to such measures as the shorter workweek, longer vacation periods, early retirement, retraining, and heavy reliance on attrition rather than dismissals to adjust to manpower requirements. More important, however, is the fact that most railroad employees have civil service status (Beamte) and cannot be dismissed or downgraded except for serious infractions, e.g., stealing. There are presently about 450,000 employees on the railroads divided about equally between blue-collar and white-collar workers.

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[8] *European Social Security System*, Joint Economic Comm., 89th Cong., 1st sess., U.S. Government Printing Office, Washington, 1965, p. 11.

The union and management have agreed that a "social plan" must be prepared before the implementation of any large-scale rationalization measure. This plan should include "precise details" regarding employees who will be affected, including their abilities, age, marital status, number and age of children, and whether or not they are homeowners. The parties then consider each case individually with respect to possible transfer and job opportunities in the same locality or nearby. If it is not possible to place a man on the railroads, arrangements are made to provide other employment.

The agreement provides that wherever possible, the new job should not involve any loss in wages. If this is not possible, the worker has priority on a higher paying job as soon as one is available. Men with at least 2 years of service are guaranteed maintenance of previous earnings on the following scale: 15 months for 2 to 5 years of service, 22 months for 5 to 8 years, 28 months for more than 8 years. Railwaymen not subject to dimissal—those over 40 years of age with at least 15 years of service—have their earnings guaranteed for 3 years. The union has a policy of permitting overtime work only in exceptional cases. Overtime is made up by compensatory time off rather than being paid for at premium rates.[9]

Displaced railroad workers have generally preferred to accept lower rated jobs in preference to going into other work. In one case a repair shop employing 1,500 workers was closed. A motorcar manufacturing company in the same area was prepared to employ many of the displaced workers at higher wages and better opportunities for advancement than were available on the railroads. But only a few accepted employment in the automobile company. The others preferred to take lower paying jobs on the railroad—subject to the earnings guarantee—even though they were required to commute sizable distances. According to the union, the decisive factor was that work in industry is considered more intensive and faster paced than on the railroads.

The railroad agreements are considered exemplary by other unions and are believed to have been made possible only because of government ownership of the industry. In 1965 the industry operated at a deficit of DM2 billion ($500 million).[10]

The printing industry agreement provides for joint consultation on manpower requirements and wage rates before the introduction of new equipment. The agreement fixes the number of craftsmen to be employed on specific equipment. There is a guarantee against dismissal of any employee due to technological change.

Next to coal mining the textile industry has experienced the greatest decrease in employment. The industry is concentrated in three regions: Westphalia, North Rhine, and Wurtenberg. In 1964 the industry had 555,700 workers, 92,000 less than in 1957. Production workers declined by over 100,000, while white-collar employees increased in number. The union's membership of about 350,000 has remained fairly constant because it has picked up members in the garment industry which also comes within its jurisdiction. Many workers have suffered a decrease in earnings in changing jobs. About 60 percent are women who have not gone through an apprenticeship. Such training as is required has usually been given by employers.

The Textile Workers' Union has emphasized the protection of older workers and the maintenance of pension benefits at normal retirement levels despite a decrease in earnings. In Westphalia the 1964 agreement provided for the establishment of a special fund, to be used to pay the difference in pension benefits for workers over 50 who are transferred to jobs paying less than their former positions. It also assured workers, dismissed at age 60 or later, the same pension at age 65 that they would have been entitled to had they worked and continued to contribute towards their pensions until they were 65.

In the spring of 1965, the union negotiated agreements prolonging the period of dismissal notice for employees about to be displaced due to the introduction of new technology. The amount of notice varies with age and service up to a maximum of 6 months. Employees aged 63, with 25 years of service, may not be dismissed. Employees accepting lower paid jobs are guaranteed previous earnings for 6 months. The union anticipates problems in determining whether or not dismissals are caused by technological change.

Agreements in the petroleum and oil refining, airline, vegetable oil, cigarettes, and public utilities industries prohibit or limit dismissals of older workers. These agreements sometimes also provide that older workers must be assigned to jobs calling for reduced work speeds and concentration, with a guarantee against any loss of income resulting from such assignments. A cement industry agreement guaranteed workers over 55 their average income during the 10 years of highest earnings in the industry.[11]

The Metalworkers' Union, which has been the most vocal with regard to the adverse effects of automation on workers, admits to having relatively few contractual provisions designed to ease the impact of technological change on its members. It does, however, have a contract with Volkswagen covering 80,000 workers which gives income security for 6 months in cases of downgrading, and "total employment and income guarantees" for those over 55 years of age. The union's current demands include a reduction in the standard workweek from 41.5 to 40 hours and an increase in vacations with pay to 24 days from the present levels required by law. Legal minimum standards are: 18 days vacation for those over 35 years of age, 15 days for those 18 to 35, and 24 days for youths under 18. The union is also asking for:

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[9] P. Seibert, president, German Railwaymen's Union, Address to International Transport Workers Federation, Copenhagen, 1965 (mimeo).

[10] Letter from G. Friedrichs, Nov. 22, 1965.

[11] "Adjustments to Technological Change in West Germany," draft report, prepared by Automation Division, International Labor Organization, Geneva (unpub.).

1. Planning for social adjustment to accompany planning for technological change.
2. A guarantee against loss of income when workers are transferred within the plant. In order to avoid different rates for the same job, employers would be permitted to "buy out" the differential by a lump-sum payment.
3. Six months' severance pay in addition to unemployment insurance for dismissed workers.
4. Adult training programs in industry under government sponsorship.

Effect of Codetermination Laws

Codetermination laws give Works Councils the right to be consulted on social and personnel questions and economic matters. Though theoretically the Works Councils are independent of the trade unions, in practice unions maintain close contact with Works Council members, a large majority of whom are union members. The following changes in plant operations are regarded as properly subject to codetermination: Reductions, closures, or transfers of the whole or of substantial sections of the works; amalgamation with other works; basic changes in the purpose of the works or its installations, if they are not obviously dictated by the market situation; and introduction of new basic working methods, if they are obviously not serving technical progress.

If the Works Council and the enterprise cannot agree on these matters, a Conciliation Board, consisting of a representative from each side and an impartial chairman, may be appointed. The board determines whether the proposed change is economically justified, whether it complies with the principles of reasonable industrial management and what its effects will be on working conditions as well as the social consequences for the workers. Eventually the board makes a conciliation proposal which, however, is not binding on the parties.

More important, at least in theory, than the Works Council is the Economic Committee which can be established in enterprises with more than 100 permanent employees. It consists of four to eight members, half appointed by the employer and half by the Works Council. All members of the Economic Committee must belong to the enterprise. The committee is supposed to concern itself with production and working methods, including production engineering and utilization of labor; production programs, including selection of products to be manufactured, introduction of new models, utilization and expansion of production capacity, etc.; and the economic, production, and sales situation of the enterprise, and "other matters vitally affecting the interests of the employees."[12]

While its charter appears to be very imposing and sounds as if it might include the effects of technological change on employees, in practice the Economic Committee has turned out to be relatively unimportant. It functions only in an advisory capacity to the employer; it can make suggestions and proposals, raise objections, and inform the management about the views of workers. But it cannot force the employer to do anything he does not wish to do. In 1961 only one-third of all qualifying enterprises had economic committees. Where they existed they often did not meet quarterly as required by law. Furthermore many members of economic committees take seriously their obligation to "maintain secrecy on matters discussed at meetings."[13] Unions would like to work through the economic committees to get advance information and to influence management decisions on technological changes and their effect on employees. Despite the fact that these committees have not been very important to date, unions are encouraging workers to ask that they be set up, where authorized by law, in the hope that they will be able to educate their members to make them more effective in the future.

Codetermination is most important in the coal and steel industries. Each company has a Board of Supervision consisting of 11, 15, or 21 members, depending on its capitalization. Management and labor always have equal representation. Thus, on an 11-member board, 4 are from the shareholders' side and 4 from the workers' side; 2 additional "independent" members, 1 of whom is appointed by the shareholders and the other by the German Trade Union Federation (DGB); and the "11th man," who is supposed to be neutral and often serves as chairman.[14] Two of the four workers' representatives are appointed by the Works Council and two by the DGB. The law also provides that each coal and steel company must have a labor director acceptable to the employee members of the board. The labor director has equal rights with the other two managing directors of the company responsible for commercial and technical matters. He is responsible for all "social" and "personnel" matters, and therefore can play an important role in decisions affecting displacement, transfer, and dismissal of employees, and measures which might be taken to ease the impact of automation and technological change. All major decisions also require the approval of the Board of Supervisors.[15]

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[12] *Codetermination and the Law Governing Works Councils and Staff Representation in the Public Services*, Monograph No. 23, Federal Ministry of Labor and the Social Structure, 1963, p. 41.

[13] *Ibid.*, p. 46.

[14] The law does not require that this neutral member should serve as chairman of the board. Experience has shown that the "11th man" (or 15th or 21st) generally tends to favor either management or labor. Actually, therefore, the 2 parties agree to a certain "balance of power" with the "neutral" members in about 50 percent of the companies being prolabor, and in the other 50 percent promanagement; or in the case of the chairmanship going to a shareholders' representative, the neutral member would be prolabor or vice versa. (Ulriksson, *op. cit.*)

It is difficult to determine the effect of codetermination on management decisions regarding automation and technological change. The labor director of a large steel company told us that "once all the facts are in, my attitude on technological change or other decisions affecting employee security is not essentially different from that of any progressive personnel director." Unions, however, believe that codetermination gives them an important voice in the basic industries and are asking that the system in coal and steel be extended to other industries.[16]

The best systems for "social planning" have been worked out in industries where codetermination exists. "Social plans" in the coal and steel industries call for consultation on transfers, retraining, and financial assistance for dismissed workers. Severance pay agreements, at the company level, also exist in these industries to supplement benefits available from the European Coal and Steel Community. Income guarantees are quite common in these industries. In one coal mining company the collective agreement provides a flat income guarantee of DM500 ($125) per month to all underground miners over 50 years of age and to all other workers over 55, until they became eligible for government old-age pensions. Another firm paid 750 workers aged 63 or older, who agreed to be dismissed, 100 percent of their previous earnings for 3 months and 65 percent for the next 9 months. Unemployment benefits were not credited against this guarantee so that dismissed workers received more than their former earnings for a period of 3 months. Several agreements permit dismissed workers over 55 to retire with the full pension they would have been entitled to at age 65. The cost to employers of such supplementary pension schemes is usually about 5 to 15 percent of earnings, depending on length of service.[17]

Government Programs

The Federal Republic of Germany under the Christian Democratic Government believes strongly in a "free market economy" and is opposed to "planning" or "programing" for the future. This policy has the support of the Employers Association and trade unions. Even though the trade unions favor more government planning, more effective government programs, and more research on the effects of technological change, they fear too much government intervention into the private life of the individual. A representative of the DGB expressed the trade union view as follows:

> Consideration of the problems connected with the labor market and active manpower policy gives rise to a number of special problems where trade union policy is concerned. As a result of experience in Germany between 1933 and 1949, there is a certain sensitivity about the possibility of infringing on the personal freedom and the respect of the workers by political measures, particularly those adopted by government departments. The trade unions in the Federal Republic are particularly anxious to ensure that there is no infringement on the rights of the workers. There is a further danger in the possibility of the working man being regarded as an "economic factor" or a "potential" and "regimented" or "administered" by a government department.
>
> In our opinion, in all matters concerning man as an individual part of the labor market, his own wishes must be decisive, and no political force or government department measures should have the power of influencing his decision.
>
> For example, the various instances of the Ministry of Labor should only have the power to help or advise [sic]. In no case should direct or indirect measures of direction or obligation be used to restrict personal freedom, not even in the alleged interests of individuals or the community, or to restrict the free choice of jobs, place of training, and occupation. Only if these basic principles are observed can full employment in liberty be ensured.[18]

Its antipathy to planning and government intervention has not kept the West German Government from adopting a variety of programs to promote full employment and protect workers from some of the hazards of a free market economy. These programs deal with such subjects as unemployment insurance, old-age pensions, procedures to be followed in mass dismissals, job placement and vocational guidance, bad weather payments for construction workers, labor mobility, industrial relocation, foreign labor, workers' housing, and vocational training. Most of these programs are administered by the Federal Institute for Placement and Unemployment Insurance.

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[15] *Codetermination and the Law, op. cit.*, p. 45.

[16] The Federal Minister for Labor and the Social Order, Hans Katzer, recently stated that the government is opposed to extending codetermination as it exists in coal and steel to other industries (press release of interview in the *Kölnischen Rundschau,* Oct. 27, 1965).

[17] ILO Draft, *op. cit.*

[18] W. Henkelmann, on Germany, *International Trade Union Seminar on Active Manpower Policy, Supplement to the Final Report,* Sept. 17–20, 1963, OECD Manpower and Social Affairs Directorate, p. 137.

Unemployment Insurance

The Federal Republic has a system of compulsory unemployment insurance which covers about 90 percent of all wage earners and salaried employees. Salaried employees earning DM1,800 ($450) or more per month are excluded from coverage. State unemployment assistance is available to those who exhaust their insurance benefits. In certain industries, unemployment benefits are provided through the European Coal and Steel Community and the European Economic Community. Private schemes and trade union programs may supplement unemployment benefits provided under public programs up to 100 percent of previous income, but this occurs rarely.

Unemployment insurance is administered by the Federal Institute. Contributions are paid in equal amounts by employers and employees, and have varied from 3.25 percent of earnings and payrolls to nothing at various periods between 1949 and 1965. Only the first DM750 ($188) of monthly income is subject to this tax. Currently the contribution rate for each party is 0.65 percent. The resulting fund is used not only to finance unemployment insurance, but also to pay for placement, vocational guidance, and other activities of the Federal Institute. Benefits vary with earnings and family status of the unemployed worker. They generally amount to almost 90 percent of earnings for workers in the lowest income bracket, and 40 to 70 percent for those earning DM175 ($44) or more per week. In 1963, a single male received an average of DM58 ($15) per week, or about 56 percent of his gross earnings. A married man with two children averaged about DM85 ($21) in unemployment insurance, or about 70 percent of earnings. The maximum benefit is DM 750 ($188) per month.[19]

The benefit period varies from 13 to 52 weeks, depending upon the period of insurable employment. The maximum period of 52 weeks is reached after 3 years of employment. Those who exhaust their insurance benefits are eligible for unemployment assistance on the basis of a means test which is applied in a liberal manner.[20] Assistance payments amount to about 10 percent less than insurance benefits and are paid for an unlimited period in case of need.

The ECSC provides unemployment insurance for workers in the coal mining and iron and steel industries if the employer is obliged to reduce, terminate, or change his business activities, resulting in dismissals. Benefits are payable up to 12 months, with individuals receiving up to 70 percent of former gross earnings. Costs are shared equally by the ECSC and the government. Similar benefits are available under the EEC for workers affected by industrial change. Benefits cover up to 80 percent of former earnings.

Old-Age Pensions

Normal retirement age is 65. All wage and salary earners who have paid contributions to the system for at least 15 years are entitled to receive old-age benefits. Compulsory old-age insurance applies to all blue-collar workers regardless of their income, and to all white-collar workers earning up to DM1,800 ($450) monthly. White-collar workers who have previously been covered by compulsory insurance may continue insurance on a voluntary basis when they are no longer subject to compulsory insurance because their earnings exceed the ceiling of DM1,800 monthly.

Pension benefits are calculated by multiplying 1.5 percent of a worker's "assessed wages" by his years of coverage. Assessed wages are arrived at by adjusting a person's relative wage to the average wage level in the 3 years before his retirement. Thus, a worker with 30 years of coverage receives not 45 percent of his actual average earnings, but 45 percent of his average earnings adjusted upward to reflect the increase in the average wage level. The maximum retirement pension is DM750 ($188) and the average benefit about DM400 ($100) per month. Old-age benefits are adjusted annually in accordance with movements in wages and salaries. Workers and employers each contribute 7 percent of earnings to support the system. Retirement from work is not necessary in order to qualify for a normal pension at age 65 and, in 1963, 25 percent of males and 8 percent of females over 65 were "economically active."[21]

Workers over 60 who have been registered as unemployed for at least 1 year may retire at a slightly reduced pension—about 10 percent below the normal amount. Underground miners generally retire at age 60 at a pension which is usually equal to or higher than the normal pension at age 65 for other workers. Since 1963 a coal miner over 55 who has lost his job "for reasons beyond his control" is eligible to receive up to 80 percent of his "pensionable wage," provided he has worked underground for at least 15 years and had 15 years or more of additional mining employment.[22]

Dismissal Notice

An act of 1951 protects workers against "socially unwarranted" dismissal and also sets forth certain requirements to be followed in cases of mass dismissal. An employer must notify the

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[19] ILO Draft, *op. cit.*

[20] *European Social Security Systems, op. cit.*

[21] *Yearbook of Labor Statistics*, International Labor Organization, 1964, table 3.

[22] ILO Draft, *op cit.*

Labor Exchange in writing of any dismissal which within a period of 4 weeks will involve more than 5 employees in enterprises with 21 to 49 workers, 10 percent or more than 25 employees in firms with 50 to 499 workers, and a minimum of 50 employees in enterprises with a normal employment of 500 or more workers. He must include in the notification the comments of the Works Council in his plant, which must previously have been consulted. As long as such notification has not been given any dismissals made "remain ineffective."[23]

The employer must inform the Works Council of intended dismissals "as early as possible," and discuss "the nature and the extent of the necessary dismissals as well as the avoidance of hardships arising as a result of such dismissals."[24] Consent of the Works Council to the dismissal is not required, its main task being to reconcile the parties and settle any differences that may arise between employees and the employer.

An employer must wait at least 1 month after notifying the Labor Exchange before going ahead with the dismissal, but he does not need the consent of the exchange before acting, unlike the situation in France and the Netherlands. The Labor Exchange may extend the waiting period up to an additional month, or shorten the period where circumstances warrant. An individual worker may appeal his dismissal if he considers it to be "socially unwarranted"; e.g., if he considers the method of selection to have been unfair.

The law on mass dismissal is supposed to have "an inhibiting and regulatory effect" and to give the Labor Exchange an opportunity of "intervening and helping."[25] The law applies to all enterprises, private and public, except seasonal industries, construction, shipping, and air transport. Upon notification of a pending dismissal, the Labor Exchange is supposed to check with the employer to see whether he has taken reasonable measures to avoid dismissals or hold them to a minimum. These may include early retirement, stopping recruitment, transfers within the plant or company, putting the work force on a shorter workweek, etc. In a few instances the Labor Exchange has been known to request a delay in the closure of coal mines to allow more time to find alternative employment for workers about to be dismissed.

The Works Council does not generally agree or disagree on the need for a mass dismissal. However, unlike France, the Works Council does not usually protest and try to prevent the dismissal by political or other kinds of pressure. Works Councils also have been known to help employers in preparing the order of dismissals, which is supposed to take account of age, length of service, family status, and the general economic circumstances of the workers. In Germany, as in some other European countries, there is a feeling of social disapproval attached to large-scale dismissals, which employers try to avoid because they feel it reflects on the company's reputation.

Quite apart from the notification procedure, all employees are entitled by law to receive advance notice before being dismissed. The advance notice requirements vary with the method of payment for the individual. In general, production workers in industrial employment and miners are entitled to 2 weeks' notice, unless a collective agreement provides for a different period (even if it is less than 2 weeks). Salaried employees, paid on a monthly basis, must be given at least 1 month notice before the 15th of the month. Commercial and technical employees are entitled to 6 weeks' notice and can be dismissed only at the end of a quarter. There are special provisions for older salaried employees: Those with at least 5 years of service are entitled to 3 months' notice; for 8 years' service, 4 months' notice; and for 12 years' service, 6 months' notice. These periods may be lengthened but not shortened by collective bargaining.[26]

There are about 1.2 million established civil servants in government administration and public services who, in addition to other privileges, on the basis of pertinent legislation, enjoy full job protection and cannot be dismissed. Another 2 million blue- and white-collar workers in government and public services who are covered by collective agreement are fully protected against dismissal if they have been in government service for at least 15 years and are over 40 years of age.

Labor Mobility

The implementation of manpower policy and the organization of the labor market is the responsibility of the Federal Institute for Placement and Unemployment Insurance which has been in existence since 1927. At all levels—federal, state, and local—the Institute, which is in the Ministry of Labor, is organized on a tripartite basis.

The Employment Exchange has a monopoly on job placement activities; private agencies are forbidden by law. It has an excellent reputation with both employers and trade unions and ranks with the Swedish Labor Market Board in terms of broad acceptance. It accounts for about 40 percent of all job placements, which is a much higher proportion than in other West European countries or the United States.

In order to facilitate and encourage labor mobility the Employment Exchange is authorized to provide the following kinds of financial assistance to unemployed workers, those with temporary jobs, and persons who have received notice that they are being terminated. Only workers who can demonstrate financial need are eligible.[27]

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[23] *Notice of Dismissal and Protection Against Dismissal*, Monograph No. 13, Federal Ministry of Labor and the Social Structure, 1963, p. 17.

[24] *Ibid.*, p. 11.

[25] *Ibid.*, p. 17.

[26] *Ibid.*, pp. 6–8.

1. Traveling expenses to be interviewed for employment.
2. Removal expenses and cost of travel for the worker and his family.
3. Loans towards the cost of purchasing tools, clothing, and other things required for a new job.
4. An advance or grant prior to receipt of the first paycheck, up to DM400 ($100) per month, plus up to DM200 ($50) for installation purchases. At least DM50 ($12.50) is nonrepayable.
5. Separation expenses up to a maximum period of 2 years, varying with distance and wages, if a worker must live away from home.

The total cost of these financial aids has diminished considerably since the achievement of full employment. In 1955 they amounted to DM7,757,000 ($1,939,250), in 1960 to DM3,380,000 ($845,000), and in 1962 to DM1,947,000 ($489,400).[28] The Employment Exchange is also authorized to subsidize housing and to provide subsidies or loans to encourage the building of housing in areas where suitable accommodation is not available for incoming workers.

The West German Government concluded a special agreement with the European Coal and Steel Community to encourage mobility among workers employed in coal mines which were preparing to close by April 30, 1963. The agreement entitled dismissed mineworkers who were either unemployed or undergoing occupational retraining to a waiting allowance equivalent to 50 percent of their previous earnings plus additional payments for dependents. The ECSC also agreed to assume part of the cost of retraining. Discharged mineworkers accepting employment in industries other than coal mining were entitled to a differential allowance to enable them to earn 60 percent of their previous earnings plus an additional dependents' allowance. Workers finding new employment in the coal mining industry but suffering a loss in earnings were also given a differential allowance. Mineworkers who left by agreement with the employer and received either a disability pension or a regular miners' pension were given a leaving allowance of DM3,000 ($750). Employers paying special allowances to miners leaving voluntarily were entitled to 50 percent reimbursement under the agreement.

The DGB has expressed some reservations regarding encouragement of geographical mobility by the Employment Exchange. It prefers that greater efforts be made to bring industry to areas of surplus manpower rather than move workers to jobs in other areas. In actual practice there has been little need to move workers in recent years. Unlike other countries, which have some depressed areas even while the country as a whole has full employment, West Germany has no serious regional problems. As of the summer of 1965 there were no "Lander" with an unemployment rate in excess of 1 percent of the labor force. Consequently there is no great need to induce industries to locate new plants or to decentralize into areas of surplus labor. Should such measures be called for, the Federal Institute has authority to provide credits for the erection of factories and offer financial assistance to certain branches of industry and areas needing help.

"Bad Weather" Payments in the Building Industry

In order to eliminate seasonal unemployment in the construction industry the government instituted in 1959 a program to encourage building activity between November 1 and March 31, when construction work previously tended to come to a standstill. The program includes:

1. A contribution of about 11 percent of wages to persons and firms for whom building is done.
2. Loans to building contractors to finance the organization and reinforcement of building sites and the provision of appropriate machinery.
3. Loans and subsidies to pay for winter clothing.
4. Payment of 45 to 55 percent (depending on family size) of wages lost to individuals when work cannot be done on account of bad weather, even though they have not been laid off.

The purpose of this program is to enable building contractors to keep their labor force more or less intact during the winter months and to continue work when weather permits—which is usually a good part of the total period. It also means that construction work is able to be stepped up rapidly as soon as the weather improves, because workers do not have to be recruited back from other employment. The system is financed through the regular unemployment insurance contributions.

The 1959 law had an immediate effect on unemployment in the building industry. Peak unemployment dropped from 600,476 in the winter of 1958–59 to 238,522 in the winter of 1959–60. It continued to decrease, along with total unemployment, to 101,857 in the winter of 1962–63. While other factors also served to reduce unemployment during this period, the "bad weather" payments law is credited with making a significant contribution towards stabilizing year-round employment in the building industry at a high level. West German officials also ascribe the sharp decline in general unemployment—from 1.9 percent in 1959 to 0.5 percent in 1962—in large part to the adoption of "bad weather" payments.[29]

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[27] M. S. Gordon, *Retraining and Labor Market Adjustment in Western Europe,* Office of Manpower, Automation, and Training, U.S. Department of Labor, August 1965, p. 157.

[28] F. Sellier and C. Zarka, *International Differences in Factors Affecting Labor Mobility—Inter-Industry, Occupational and Geographical: Selected Countries of Western Europe,* International Labor Office, Geneva, 1965 (preliminary draft, mimeo.), pp. 146–147.

The Apprenticeship System

Vocational training in Germany is based on the apprenticeship system. About two-thirds of all those leaving school sign apprenticeship contracts at 14 or 15 years of age to learn to become skilled or semiskilled workers in industry, commerce, services, or handicrafts. Of the remaining one-third, about 15 percent go to technical schools, 8 percent do not take up any occupation and only 10 percent take jobs as unskilled workers.[30] In 1963 there were 546 recognized apprenticeable trades, of which 380 were in industry and commerce, 99 in handicrafts, 15 in agriculture, and 52 in other occupations.[31] However, 70 to 80 percent of the 1,225,000 apprentices were being trained in 12 to 15 trades.

Almost all occupations in Germany are considered "apprenticeable." For example, a clerk in a travel agency is trained as an apprentice for 3 years, with related theoretical instruction in school 1 day each week. Upon completion of apprenticeship, he or she receives a diploma as a "commercial employee in a travel agency." Most skilled occupations require 3 to 3½ years of training in an apprentice capacity; semiskilled occupations call for 1½ to 2 years.

There is an extensive system of vocational guidance to direct young people into apprenticeship training, which is supposed to take into account the needs of the economy as well as the aptitudes and interests of the youth. In 1963, almost all those leaving school attended vocational information sessions conducted in the schools by the Employment Exchange, and a very large proportion received individual counseling. If a suitable vacancy is not available in a youth's home district, the Employment Exchange helps him find a vacancy in another locality. Should the parents not be able to pay for his living away from home, a maintenance allowance is provided from the funds of the Federal Institute.

In the last analysis, however, the choice of a trade is made voluntarily by the youth or his parents, provided a suitable vacancy can be found. The employer-apprentice relationship may be broken by either side only during the first 3 months of the apprenticeship, which serves as a probationary period. About 90 percent of all who start apprenticeship training complete the prescribed course. Apprentices must attend school 1 day a week or the equivalent until the age of 18 (or 21 in a few states) as part of their training. The remainder of the time is spent in the shop or in employer-operated schools.

Employers are expected to follow instructor guides prepared by the Vocational Training Section of the Ministry of Labor, after consultation with interested organizations. This is designed to result in a uniform training program to prepare trainees for the trade examination which they must take upon completion of apprenticeship. The system is policed by employer organizations. Unions complain that they are not adequately consulted in the preparation of the training guides nor do they have anything to do with seeing that the guides are followed. It is widely recognized that the guides are out of date and do not take into account recent developments affecting many trades. Given the multiplicity of apprenticeable trades, jobs are changing too fast for the government to be able to keep the guides up to date. Instructors often train apprentices so that they will be able to pass the final examinations, but without much regard for the latest techniques in the trade. Apprentices who fail the examination may repeat it but often prefer to find a job rather than continue in training on an apprentice's allowance. A company's reputation suffers if many of its trainees fail the examination. Given the tight market for suitable trainees, companies try to make their programs as attractive as possible.

Apprentices are paid an "educational allowance" rather than a wage. The allowance is usually determined by collective bargaining with the union in the industry. In the metal industry, the allowance amounts to DM120 ($30) per month during the first year, DM130 to DM140 ($32–$35) for the second year, and DM160 to DM180 ($40–$45) during the third year. Thus the top allowance is only about 20 percent of the average earnings of a skilled tradesman, which is about DM850 ($212) per month in the metal industry. The starting wage, after completion of apprenticeship and until the age of 21, is limited to 80 percent of a skilled worker's normal wage. Everyone who completes apprenticeship training is considered to be skilled.

There is much criticism of the apprenticeship system, and it is presently undergoing reevaluation. Trade unions, large employers, and some government officials are highly critical of the system; its strongest defenders are found among the handicrafts, small employers, and officials of the Ministry of Labor, who oppose any significant change in the present system.

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[29] *Promotion of All-the-Year-Round Employment in the Building Industry*, Monograph No. 7, Federal Ministry of Labor and the Social Structure, 1963; see also Gordon, *op. cit.*, pp. 10–11.

[30] *OECD Trade Union Seminar, op. cit.*, p. 142.

[31] Letter from Federal Ministry of Labor and the Social Structure, Nov. 25 1965.

The apprenticeship system, as presently constituted, has been criticized on the following grounds:

1. It is "perfectionist" and too "narrow" to meet the needs of modern industry. This is especially true in the handicraft undertakings and in small commercial and retail establishments. The right to conduct a handicraft undertaking is reserved by law to skilled workers in crafts—"one who has qualified himself by being an apprentice and later on a journeyman, and finally by passing the examination of mastership.[32]
2. There is too much emphasis on practical work and not enough on theoretical aspects of the trade.
3. The apprenticeship period of 3 to 3½ years is too long.
4. The educational allowance is too low. Unions claim that it is routine for a handicraft undertaking or small shopkeeper to take on a few apprentices and use them for productive labor after a year or so of training. Upon completion of apprenticeship, many leave to take jobs in industry, even for lower skilled work in other trades, because the pay is better. The small employer then takes on new apprentices and the cycle starts all over again. The employer does not mind losing his trained workers to industry because the jobs are easy to learn and apprentices are much cheaper than fully trained workers.
5. Too many apprentices are being trained by handicraft and small employers and not enough by industry. Furthermore they are being trained in the wrong trades. This encourages the cycle described above. Unions charge that many large employers intentionally leave jobs open for workers trained elsewhere, as they have many jobs which do not require the 3 to 3½ year training periods called for under most apprenticeship programs.
6. There are too many apprenticeable trades. Many jobs using workers who have completed a 3 year apprenticeship can be performed by semiskilled workers with only 1 or 2 years training. Krupp, the large steel entrepreneur, estimates that he needs 20 percent skilled workers with 2½ years training, 45 percent with 2 years of training, 25 percent with 1 year, and 10 percent supervisory employees.
7. The apprenticeship system, completely controlled as it is by employers, makes for a degree of discipline and authoritarianism in industry which is incompatible with a democratic society.
8. Apprenticeship training should not start as early as age 14 or even 15. Boys and girls are not ready to choose a trade at that age. A broader educational base of 10 years compulsory schooling to age 16 should precede training in industry.
9. For some trades, training can be better done in schools than in industry.

Those who defend the present approach, with perhaps some minor modifications, point to its great success in meeting the nation's needs for skilled workers during the postwar period. They say that West Germany suffers less than other countries from a shortage of skilled craftsmen and that this is explainable, in large part, by the apprenticeship system. The fact that many apprentices leave the trade for which they have been trained to accept other work does not disturb these people. For them, the important consideration is that the boy or girl be properly introduced into the world of work during apprenticeship, and not the particular trade that he or she learns. They point to the relative ease with which displaced workers have been able to transfer to new jobs, new firms, and even new industries, with practically no need for retraining. The prime example cited is of coal miners who have allegedly transferred to other industries with little difficulty.[33]

Handicraft training was defended by Labor Ministry representatives as readily transferable to industry and not inferior to the training in larger firms. The shortage of apprentices in relation to requirements for new entrants leads to competition among employers in offering the best possible training opportunities. Some enterprises have been excluded from apprenticeship training because their programs have not met government or employer organization standards. One case was cited in which a court assessed damages against an employer for providing inadequate training and therefore not living up to his apprenticeship contract.

The present thinking seems to favor increasing the period of compulsory education—about 50 percent now receive 9 years schooling to age 15, and this will probably become universal soon, with 10 years, to age 16, some years in the offing; reducing the number and broadening the content of apprenticeable trades; developing a three-step approach to apprenticeship, with the end of each year serving as a terminal point for some occupations. The three-step approach is presently being used on an experimental basis in the mechanical and electrical trades in four districts and breaks down thus:

Step 1 (1 year): Elementary and basic training applicable to a variety of trades in the metals field; applicant to be tested at the end of 1 year to determine whether he continues in training or goes to work, with the opportunity to return for additional training in a few years.

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[32] *The West German Economy*, 2d rev. ed., pub. by Deutsches Industrieninstitut, Cologne. p. 170.

[33] A union representative points out that Turkish, Spanish, and Italian workers, with little education and no training, do the same work in automobile plants as the former coal miners. (Friedrichs letter, *op. cit.*)

Step 2 (1 year): Stress on theory and technical knowledge. Again applicants will be tested to determine who go on and who go to work at their present level of ability.

Step 3 (1 year): Designed for top-skilled workers in a specialized trade (e.g., toolmakers, electricians, machinists, etc.).

If successful, the three-step approach or some modification of it, will be extended to more trades or families of trades, and eventually will replace the narrower, more uniform system presently in use.

Retraining

Retraining for adult workers under government auspices has been relatively unimportant in West Germany since the advent of full employment. In 1962 only 4,600 persons, 0.02 percent of the labor force, completed government-sponsored training programs, a smaller percentage than in any of the other countries studied except the United Kingdom. During the 1950's the Federal Institute was retraining about 40,000 adults per year, all of them unemployed and/or disabled. The present program is still largely confined to these two groups, but there is talk of extending it to those threatened by unemployment and even to others.

The West German retraining program has been different in some respects from those in most other West European countries: West Germany is the only country where allowances for trainees are related to earnings, with higher payments given to workers formerly employed in better paying jobs; the program is financed entirely out of unemployment insurance reserves—an aspect trade unions have objected to; it has emphasized courses for women, who comprised at least half of the trainees during most of the 1950's; white-collar occupations, such as typing, shorthand, accounting, and sales, have been heavily emphasized, and the total program has been much more diversified than in other European countries. Courses usually run for 13 weeks, but may be extended to 26 weeks in exceptional cases. Trainees may be permitted to take more than one course.[34]

Much of the retraining in West Germany takes place in industry, sometimes with a subsidy from government. There is also considerable training given by trade unions and private institutions. The Federal Institute is authorized to refund to employers giving training to formerly unemployed workers up to 70 percent of wage payments during the first 4 weeks, and 50 percent for the next 22 weeks. Similar subsidies may be paid to employers hiring the long-term unemployed (e.g., about 1 year) or persons over 45 who have been without work for at least 6 months. Such payments usually amount to 50 percent of wages and may go as high as 70 percent in exceptional cases. They are generally limited to 26 weeks but may be extended by the Federal Institute.

Quite apart from the reduced need for retraining the unemployed as a consequence of full employment, German employers insist that vocational training under their apprenticeship system enables workers to adapt to new jobs with a minimum of retraining. They cite the case of the telephone system which transferred workers displaced as a result of automation to new jobs without any additional formal training. Similarly, transfers were made in the post office with additional training up to a maximum of 3 weeks. We have already discussed the alleged adaptability of coal miners to automobile manufacturing with only a few days on-the-job training.

There is some evidence, however, that not all workers in coal and iron mining and in the iron and steel industry were able to make the transition to new jobs without retraining. The High Authority of the European Coal and Steel Community is authorized, under article 23 of the Treaty of Paris, to protect workers against the initial consequences of the establishment of a common market in coal and steel. Some undertakings in the member countries were unable to survive under the new competitive conditions and either had to close down or reorganize themselves from top to bottom. In either case workers were liable to lose their jobs. In order to protect workers against these hazards, the ECSC, in cooperation with the member countries, agreed to provide workers threatened by unemployment with various allowances which enabled them to (1) look for alternative employment; (2) learn new jobs that will help them find new employment; and (3) move to new jobs. West Germany has been the largest single beneficiary of this program. Between March 18, 1954, and February 9, 1960, the ECSC allocated $17,346,000 to aid the West German Government in providing retraining and other financial assistance to 54,200 coal miners, 250 iron ore miners, and 650 iron and steel workers. From March 29, 1960, to January 31, 1964, the allocation amounted to $8,239,000, benefitting 35,407 coal miners, 5,770 iron ore miners, and 2,984 iron and steel workers. While we do not know what proportion of the funds went to defray the cost of retraining as compared with unemployment and resettlement grants, the program is referred to as a "retraining scheme" and we therefore assume that retraining was an integral part of the total program.[35]

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[34] Gordon, *op. cit.*, p. 48.

West Germany has also benefited from contributions from the European Social Fund of the European Economic Community (see chapter 3). Revisions being made in the charter of this fund will permit contributions for retraining within existing employment if the development of new production techniques makes this desirable. Employees will be entitled to receive up to 90 percent of previous earnings while undergoing training.[36]

Social Promotion

Since 1959 the government has given assistance to institutions providing supplementary training for "professional advancement," as well as to employed workers taking such training in order to upgrade their skills. (The term "professional" is used in a much broader sense in Europe than in the United States. It includes almost any occupation for which some kind of training or education is necessary.) Trade unions have been very active in providing this kind of training. The German Employees' Union (DAG) offers a large variety of courses, and the DGB and its affiliates operate more than 100 schools offering courses in electronics, data processing, and other new fields. The military services offer special courses to enlistees after they leave the service as an inducement to attract recruits. The bulk of this kind of training is given in industry with hardly any assistance from public funds.

Five million German marks ($1,250,000) have been budgeted each year to aid institutions. Grants are given up to 50 percent of the total cost of equipment and operating expenses; low-interest loans are also available. Trade unions, employer organizations, and independent institutions share about equally in these aids. To be eligible an organization must offer training "maintaining, completing, or enlarging skills or knowledge previously acquired through basic vocational training or during subsequent employment." [37] The emphasis is on professional achievement, which presumably might include courses to help individuals learn skills required as a result of introduction of new technology where they are employed.[38]

In order to be eligible for assistance, individuals must have worked at least 2 years after finishing their apprenticeship, or have 7 years' experience if they did not go through formal vocational training. Subsistence allowances vary with family and local conditions; the range is from DM290 to DM624 ($72–$156) per month, which was close to the average monthly income of wage earners in November 1963. More than 90 percent of the awards have been given for full time training, the remaining 10 percent being allocated for part-time training and correspondence courses. The last two programs are expected to increase as payments are liberalized and the means test is eliminated. Worker grants and loans have only been given since 1962. During the first 2½ years of the program, DM61 million ($15 million) were awarded to 34,400 applicants, 75 percent as grants and 25 percent as low interest loans.

A new law "to promote vocational proficiency" will make grants and loans available to persons who have lost touch with recent technological developments because they work in enterprises using obsolete equipment or have been out of the labor force for some time (e.g., married women). These persons will be eligible even if the training they take is not designed for "professional advancement." The government is considering waiving the means test for such applicants. Funds will also be available for construction, enlargement, and equipment of institutes providing training under this law. This program is being financed by a special fund of DM560 million ($140 million) acquired by denationalization of the Volkswagen Corp. The plan is to maintain the basic capital and use only the current income, which should amount to DM20 to DM30 million ($5–$7.5 million) per year.[39]

The main distinguishing feature of adult training in West Germany is the multiplicity of programs available under government, employer, union, private, and international auspices.

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[35] F. Vinck, "Industrial Conversion in the European Coal and Steel Community," *International Labor Review,* June 1965, pp. 493–495.

[36] J. Dedieu, on European Economic Community, in *OECD Trade Union Semniar, op. cit.*

[37] ILO Draft, *op. cit.*

[38] A union representative comments that "training for adults looks a lot better than it is. . . . Programs are mostly devoted . . . for the middle classes. Legally, normal workers can participate. But in reality there are only a few possibilities. Even adult programs of unions and other institutions [are lacking] because of the very limited knowledge of future needs. Most union and other programs are outdated. According to the latest legislation, we have available considerable amounts for promoting purposes; but we do not have the facilities that could do the job." (Friedrichs letter, *op. cit.*)

[39] ILO Draft, *op. cit.*

Chapter 5. Sweden

In terms of most indicators of economic well being, Sweden has the highest standard of living of the five countries studied and probably of any country in the world except the United States and possibly Canada. Per capita GNP at $2,045 in 1963 was second only to the United States ($3,090) and Canada ($2,260), and at least $300 higher than any other European country except Switzerland. Relative to its population, Sweden also ranks at or near the top in ownership of automobiles, telephones, and television sets and in electric energy and steel consumption, housing facilities, and average hourly earnings.[1] We have also noted earlier that Sweden has more computers in relation to its nonagricultural labor force than any other European country except Switzerland.

Factors Affecting Technological Development

Sweden's growth rate and labor productivity have not increased as rapidly as in a number of other West European countries in recent years. But like the United States, Sweden started from a much higher level and did not have the "technological backlog" that characterized such countries as France, West Germany, and Italy. By keeping out of war, Sweden has had the advantage of not having to invest in reconstruction of its economy and the disadvantage of accumulating old plants and equipment which need to be modernized continually. In addition to office automation, Sweden is furthest advanced in its paper and pulp, shipbuilding and steel industries. Swedish industrial management is largely university trained; a high proportion of the top managers have an engineering background, with economics next and gaining in importance.

The size of Swedish industrial establishments is small by United States or even West German standards. In 1959, only 54 firms had 1,000 or more blue-collar workers and accounted for 16 percent of total industrial employment. Firms with 201 to 500 production workers numbered 412 and employed the largest percentage of the total—18.5 percent. At the low end of the scale, there were 7,653 industrial establishments with 6.5 percent of all wage and salaried employees.[2] Despite this preponderance of small- and medium-size companies, Sweden is acknowledged to be in the forefront of technical progress in Europe along with West Germany. Technological advance also appears to be widespread among Swedish industry, and there is little of the talk of a dual economy with both a modern and traditional sector that one hears so much about in France and West Germany. This may be related to the fact that most industry is located in a relatively small area—the southern half of the country, the northern half being sparsely populated and little industrialized.

The major spurs to technological development are the shortage of labor which has prevailed for most of the postwar years, and the need to compete in world markets. In 1963, Swedish exports accounted for 21 percent of GNP—more than any other European country except Belgium, the Netherlands, and Denmark. Imports amounted to 22 percent of GNP, a figure exceeded only by the three countries just mentioned and Norway.[3] The major factor limiting the introduction of automation and technological advance is the relatively small size of the domestic market, though this becomes less important for such major export industries as pulp, paper, and cardboard, machinery and instruments, transportation equipment, and base metals and their products. Capital, skilled labor, and managerial ability were never mentioned as limitations on technological advance as they were in some other countries.

But perhaps the major difference between Sweden and other countries is the attitude of the Swedish Confederation of Trade Unions (LO) to structural change and technological development. Trade unions in most countries consider their job to be to protect workers from the adverse effects of technological change and to secure a fair share of the benefits of change for their members. Introduction of new techniques has been considered the responsibility of management, to be accepted grudgingly or resisted, but certainly not encouraged by unions and their leaders. The Swedish trade union movement starts from a different premise, as evidenced by the following excerpts from "a trade union manifesto" prepared for the LO Congress of 1961: Full employment and higher living standards depend on "exploiting new techniques," "incessant change" in the structure of the economy, "developing a completely new apparatus of production," and closing down certain branches of activity; factors of production, including labor, must be "made more adaptable"[4]; "business firms must be favorably disposed to internal rationalization and continued technical progress"[5]; some industries would "gain in efficiency from having far fewer, but considerably larger units"[6]; "trade union policy . . . ought not to obstruct structural shifts in the economy which are the prerequisite of expansion"[7].

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[1] *Basic Statistics of the Community: Comparison With Some European Countries, Canada, the United States of America, and the Union of Soviet Socialist Republics.* Statistical Office of the European Communities, 5th ed., Brussels, 1964; and *Some Data About Sweden*, 1965–66, Stockholm's Enskilda Bank, April 1965.

[2] *Labor Market Policy in Sweden,* OECD Review of Manpower and Social Policies, Paris, 1963.

[3] *Some Data About Sweden, op. cit.*, p. 60.

The manifesto also contains recommendations on labor market policies and other measures to help workers adjust to changing technology, but the tone and major concern is set in the title, *Economic Expansion and Structural Change.* One cannot measure the extent to which trade union attitudes influence technological progress, but most outside observers would be inclined to agree with Swedish employers and government officials who credit enlightened LO policies with having made a significant contribution to growth and productivity.

The next 5 years will present a difficult challenge to the Swedish economy. The 5-year plan, issued in the fall of 1965, calls for an annual growth rate of 4.2 percent in the face of an almost stagnant labor force—0.3 percent increase per year—and an expected decrease in the average workweek. The growth objective will require annual productivity to increase at the rate of 3.9 percent per employee and about 4.6 percent per man-hour, which is somewhat higher than was achieved during the previous 5-year period, according to estimates of the Ministry of Finance.

Long-term planning in Sweden takes the form of projections and recommendations which are not binding on either the public or private sector. However, it is clear that labor, management, and government are committed to a policy of economic growth and rising productivity, which can only be attained by continued and accelerated use of automation and advanced technology wherever feasible.

Employment Structure

By United States standards Sweden has had a full employment economy throughout the last decade, during which the unemployment rate has never exceeded 3 percent of the labor force. By Swedish standards, however, 1958 was a recession year, when 2.5 percent were unemployed, and 1957 and 1959, when unemployment was about 2 percent, were not considered good years. In 1964, unemployment amounted to only 1.2 percent of the labor force and labor shortages have characterized some sectors of the labor market throughout the 1960's. The next 5 years promise to put an even greater strain on the labor market. The labor force, which now totals 3.8 million, is expected to grow at a slower rate than during the 1950's and early 1960's—0.3 percent per year as compared with 0.9 percent in 1959–63 and 0.5 percent during 1949–59.

In addition to an overall labor shortage, Sweden has also been experiencing significant structural changes in employment. Since 1950 agricultural employment has been cut almost in half as a percentage of the total labor force while other sectors of the economy, and especially "general administration and professions" increased in importance (see table 14).

TABLE 14. GAINFULLY OCCUPIED IN SECTORS OF THE ECONOMY AS A PERCENTAGE OF TOTAL LABOR FORCE IN SWEDEN, 1950–63

Sector	1950	1955	1960	1963
Agriculture	20.3	17.4	13.9	11.6
Mining, manufacturing, and construction	40.8	40.3	40.9	42.1
Trade, transportation, and communications	24.1	26.2	27.2	27.0
General administration and professions	11.1	12.7	15.3	17.1
Domestic services	2.9	2.7	2.1	1.6
Unspecified	.8	.7	.6	.6
Total labor force (percent)	100.0	100.0	100.0	100.0
Total labor force (000's)	3,105	3,398	3,550	3,616

SOURCE: *Some Data About Sweden, 1965–66,* prepared by Stockholm's Enskilda Bank, Apr. 1965, p. 105.

Within manufacturing there were also considerable shifts in employment between 1958 and 1963, with such industries as machinery, metal products, basic metals, nonmetallic mineral products, furniture, and chemicals making significant gains, while others showed little or no increase, or even declined in employment; e.g., textiles, clothing, food and beverages, printing and publishing, wood, and transport equipment.[8]

Despite its high level of employment nationally, Sweden has been plagued with regional pockets of unemployment where the rate is as high as 10 percent of the labor force. These depressed areas are in the two most northern sparsely settled counties. In May 1965, four northern counties accounted for 45 percent of the total registered unemployed. In addition, several thousand persons were employed in public works programs, of which the northern counties receive far more than their share. The situation has been and will continue to be aggravated by the government's promoting modernization of the forestry industry during the 1960's This program is expected to reduce employment in forestry from about 100,000 man-years in 1960 to about 70,000 by 1970.[9] Persistent unemployment in the northern counties serves as a constant reminder to the Swedish authorities that "the Swedish labor market is by no means in all respects so flexible that there is no danger of the emergence of structural problems."[10] Thus regional problems must be added to the general labor shortage and the changing structure of employment among economic sectors and different industries as reasons for pursuing an active manpower policy in Sweden.

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[4] *Economic Expansion and Structural Change: A Trade Union Manifesto,* ed. and trans. by T. L. Johnston, Allen and Unwin Ltd., 1963, p. 41.

[5] *Ibid.,* p. 147.

[6] *Ibid.,* p. 148.

[7] *Ibid.,* p. 150.

[8] *Yearbook of Labor Statistics,* 1964, International Labor Organization, table 9.

Occupationally the trend is toward requiring more technicians and white-collar workers and fewer production workers. In manufacturing, salaried employees constituted 22.5 percent of the total in 1950, 28.2 percent in 1960, and 30.8 percent in 1962.[11] The union with jurisdiction over white-collar workers and technicians in industry has been gaining members at a rate of 8,000 per year for the last decade. Conversely, membership in some industrial unions and in the railroad workers union has been declining or remaining constant.

The picture of the changing structure of employment in Sweden would be incomplete without some reference to the growing importance of women, and especially married women, in the current and future labor force. The labor force participation rate of women aged 14–64 rose from 44.5 to 48.5 percent during the 1950's and was expected to rise to over 50 percent by 1965. Married women showed a much higher increase—from 30 percent in 1950 to 41 percent in 1960, with a projection to 46 percent in 1965 and 50 percent by 1970.[12] By 1960 there were more married than unmarried women in the labor force and women as a group represented 38 percent of total employment. The labor market authorities are relying heavily on married women to meet the increased labor requirements of the 1960's. Judging by the record during the past few years their expectations may well be met. Between May 1961 and 1964, the labor force increased by 160,000, of which married women constituted 75 percent, unmarried women 10 percent, and men 15 percent.[13] Future success in attracting married women into the labor market will depend increasingly on the availability of part-time work and on the government making suitable arrangements for the care of preschool children while mothers are at work.

One of the very few areas criticized by the OECD in its review of Sweden's labor market policy in 1962 was with respect to Sweden's limited use of foreign labor. The OECD examiners suggested that in order to meet OECD production objectives, "the Swedish labor market authorities will have to consider a broader immigration policy than at present."[14] The OECD considered Swedish immigration policy with respect to non-Nordic countries "rather restrictive" and suggested that "certain problems could be more easily solved by immigration than by internal migration." It went on to say that "increased immigration to Sweden with its high level of productivity would be a contribution to the common growth target of the OECD."[15] A representative of the Swedish Employers Federation has stated that "it is to be regretted that important Swedish trade unions have often in practice adopted a restrictive attitude" toward immigration of other than Scandinavian nationalities, intimating that employers would be inclined to take a more favorable attitude on this subject.[16]

In 1962 there were 130,000 aliens employed in Sweden, of whom 82,000 (63 percent) were from Finland, Norway, and Denmark, 16,000 (12 percent) from Germany, and only 32,000 (25 percent) from other countries.[17] By October 1965, foreign labor had risen to 155,000, a 12 percent increase over 1962, with little change in the national distribution. Nearly 5 percent of the labor force consists of aliens, and every year some 10,000 aliens (of whom 25–30 percent enter the labor market) become Swedish citizens. According to the National Labor Market Board, the immigration of South Europeans, mainly Yugoslavs, Greeks, and Turks, began to increase considerably in the autumn of 1965. During the period July 1–November 15, close to 4,000 persons of these nationalities have probably entered the country. Plans are being made to set up a Swedish employment exchange in Belgrade and to cooperate with all three countries in arranging orderly and safe conditions for job applicants.[18]

To the structural problems outlined above must be added the displacement of employees and the changes in occupational and skill requirements resulting from technological change. In the following sections we shall examine the ways that Sweden has been trying to solve these problems, both through collective bargaining and government action.

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[9] "Forecast for Forest Labor in Northern Sweden, 1960–70," National Labor Market Board, Memorandum, Nov. 9, 1964 (mimeo), as amended by National Labor Market Board (letter from Mr. R. Thoursie, Dec. 9, 1965).

[10] K. O. Fazén, "Reflexions on Education, Automation and Long-Run Labor Market Forecasting," National Central Bureau of Statistics, Stockholm, 1965 (mimeo).

[11] *Some Data About Sweden, op. cit.*, p. 104.

[12] *Labor Market Policy in Sweden, op. cit.*, p. 16.

[13] "A Few Data on the Employment of Married Women in Sweden," National Labor Market Board, Stockholm, Memorandum, Sept. 2, 1964 (mimeo).

[14] *Labor Market Policy in Sweden, op. cit.*, p. 53.

[15] *Ibid.*, p. 68.

[16] G. Lindstrom, on Sweden, *International Management Seminar on Active Manpower Policy: Supplement to the Final Report*, Brussels, Apr. 14–17, 1964, p. 114.

[17] *Labor Market Policy in Sweden, op. cit.*, p. 47.

[18] Letter from Labor Market Board, *op. cit.*

Collective Bargaining

Labor-management relations in Sweden are conducted by strong, centralized organizations on both sides. The Swedish Employers Federation (SAF), comprising the bulk of private employers in mining, manufacturing, and construction, as well as a part of transportation service, has 44 branch organizations and 25,000 employer members with 1.1 million employees. Over 90 percent of all eligible wage earners are members of 39 industrial unions belonging to the Swedish Confederation of Trade Unions (LO) with a total membership of 1.5 million. Salaried employees are represented by the Central Organization of Salaried Employees (TCO), whose 34 member unions have about 500,000 members, or about 70 percent of all eligible employees. There is also a Central Organization of University Graduates (SACO) with 75,000 members, and a Central Organization of Civil Servants with 18,000 members.

Collective bargaining is conducted on an industrywide basis in separate negotiations between the employers' federation and each of the trade union organizations. The agreements concluded on wages and some other important issues serve as the standard for all employees. National unions and industry employer organizations then negotiate within the framework of the basic agreement. The last agreement negotiated in 1964 was for 2 years, and provided for a wage increase of about 1.3 percent in 1964 and 3.4 percent in 1965. Fringe benefits were estimated to bring the cost of the settlement to about 5 percent.[19] However, the actual increase in wages has usually been substantially higher than the negotiated increase because of the "wage drift"—a term which was originally used in Sweden to denote increases in wage rates over and above those agreed upon in collective bargaining due to the pressures of a tight labor market and certain institutional factors (e.g., loose incentive systems).

Between 1958 and 1964 total manufacturing wages in Sweden, including fringe benefits, rose by 60 percent, productivity by 25 percent, and the consumer price index by 19 percent.[20] Collective bargaining has not concerned itself in any significant way with protecting workers against technological change, this being considered the primary responsibility of government. Both the trade union federations and the employer organizations are continually and intimately involved in proposing, discussing, and implementing labor market policies in conjunction with the National Labor Market Board.

Swedish management is acknowledged by all concerned to act in a highly responsible manner in introducing technological changes which may affect employees. Long advance notice—far greater than the 2 months required by agreement between the SAF and the National Labor Market Board—is common. Notice of more than a year is not uncommon before new equipment or major processing changes are introduced. In addition, consultation is held with the Works Council in the enterprise long before and throughout the changeover period.

Severance pay provisions are not normally found in collective agreements. In fact, until recently there has been little support for the principle of severance pay, either among employers or trade unions, as it was regarded as conflicting with the overriding objective of getting the worker back to productive employment as soon as possible. In 1964 the LO negotiated a severance pay arrangement with the SAF. It provided for 0.1 percent of wages to be paid into a central fund; this would amount to about Kr. 10 million ($2 million) per year.

The LO economists consider the eligibility conditions very restrictive and few payments have been made out of the fund to date. A worker must be over 50 years of age and have at least 10 years service at dismissal to be eligible for severance pay. Each case is decided individually by a joint labor-management committee. Only about Kr. 0.5 million ($100,000) have been paid out of the fund during the first year. LO officials concede that the provision means very little at present and needs to be renegotiated.

Discussions with leaders of a few unions indicated no great concern over the effects of technological change. Trade unions support increased rationalization and automation in industry and will continue to do so as long as they have confidence in full employment. Employers, unions, and government officials accept full employment as the primary objective of economic policy and have tremendous confidence that sound government policies can and will insure the indefinite continuation of full employment.

Even a union like the Swedish Railwaymen's Union, which is losing members at a rate of 2,000 to 3,000 per year due to automation and rationalization, professes no alarm over the impact of changing technology. The railway system has been government owned since 1853. The union has 50,000 members—20,000 less than it had at its peak in 1952—and its membership includes 94 percent of all railroad employees. Rationalization started in about 1950 but there have been no dismissals of workers, all reductions being made through normal attrition.

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[19] *Some Data About Sweden, op. cit.*, p. 103.

[20] *Direct and Total Wage Costs for Workers: International Survey, 1957–64*, Swedish Employers' Confederation, pp. 83, 118.

Railroad workers tend to be older than those in other industries, with almost all of them between 40 and 60 years of age. Therefore a major emphasis has been placed on early retirement as a means of adjusting to technological change. As State employees, railroad workers may retire within the ages of 60 to 63, 63 to 65, or 65 to 66, depending upon the kind of work they do; e.g., an engineer may retire at 60 on full pension. Normal retirement age for employees in private industry is 67. Generally, State employees continue to work until the last year in their age group; i.e., 63, 65, or 66. If they retire earlier, they may work at a nongovernment job and continue to draw full pension. The average pension at age 65 amounts to about 65 percent of a man's basic wage.

Many railroad workers have had to change jobs, often after retraining, as a result of changing technology. The union is currently asking that men changing jobs be given a guarantee against loss of earnings for a few years. Other demands are for increased moving allowances to Kr.4,000 ($800) for employees transferred to a new location and full compensation for additional expenses incurred as a result of a change in job; e.g., longer commuting distances to and from work. While railway workers do not like to change jobs, the union leadership has not opposed rationalization measures because it recognizes such changes are essential to an efficient industry.

The issue of the fireman in the cab of diesel locomotives has come up in Sweden. As in the United States, the union opposed removing the fireman on grounds of safety. Eventually agreement was reached with management to eliminate firemen on certain schedules and keep them on others. The net effect was that on 45 percent of the total rail mileage in Sweden there is only one man in the cab, and two men in the remaining 55 percent. However, displaced firemen are guaranteed against loss of earnings, regardless of their new duties.

Locomotives operated by remote control are presently in the experimental stage undergoing a 6-week test period. The union anticipates that this development, if successfully introduced, may affect a significant number of locomotive engineers who may have to be retrained. The union has been in contact with the U.S. Railway Labor Executives' Association and railroad unions in other countries to learn about their experience with remotely controlled locomotives.

The Central Confederation of Salaried Employees (TCO) is not aware of any major problems encountered by its unions as a result of office automation. The only general effect upon agreements has been the addition of shift work premiums as more salaried workers are required to work other than regular shifts. There are also supplementary and early retirement provisions for white-collar workers, but these have been in existence for many years and are not related to the introduction of automation.

Computers have helped alleviate the shortage of white-collar workers rather than resulting in any significant displacements. TCO membership has been increasing at a rate of about 25,000 per year. However, some TCO unions have lost membership as a result of automation (e.g., the telephone workers); others, like the Swedish Union of Clerical and Technical Workers in Industry, have had significant membership gains due to the restructuring of the labor force in industry; and a third group, such as the Insurance Employees' Union, has had its growth slowed as a result of automation.

The union representing industrial white-collar and technical employees has 145,000 members and is the largest in the TCO. It claims to have 75 percent of its potential membership organized. Membership is growing at a rate of 8,000 per year. Many of its employers use computers but no problems have resulted for employees, according to the union. The union itself has an IBM 1401 computer in its offices and also rents time to other unions.

The union's demands in 1965 negotiations will be unrelated to the introduction of automation. It will seek salary increases and equal pay for women, who now receive about 80 percent of men's salaries for the same work; about 25 percent of its members are women.

A third labor organization, the Insurance Workers Union, has about 12,000 members spread among some 90 percent of all insurance companies; 75 percent of its members work in the four largest companies. According to the union leadership, all the large companies have introduced computers during the last 5 years with no adverse effects on employees. Installation of a computer is a management decision but is discussed with the Works Council 1 to 3 years in advance. There have been no dismissals as a result of office automation, and the union believes that the special tripartite committee which must approve all dismissals in the insurance industry would not consider the introduction of a computer as sufficient grounds for dismissal.

Computers have affected some 20 to 30 percent of all jobs in insurance companies. As on the railroads, insurance company employees are not particularly happy about the advent of office automation but "accept" it is a necessary development. There has been no significant impact on the salary structure as a result of automation. But, say union officials, no member's salary would ever be reduced, even if he was transferred to a lower rated job. Most jobs eliminated by computers have been in the two lowest job classes out of the six usually found in white-collar work.

Sweden has legislation providing for a 45-hour workweek, subject to reduction by collective agreement. Salaried employees generally have a 40-hour week. The LO is expected to ask for a reduction in the normal workweek for production workers to 42½ hours by 1968 and 40 by 1970. Premium pay for overtime work is set by negotiation. However, overtime work is limited by law to 200 hours per year for any individual, and union approval is required for overtime in excess of 100 hours. All employees are entitled by law to 4 weeks vacation with pay.

Labor Market Policy

In Sweden labor market policy is regarded "as a necessary element of an economic policy that aims at full employment, stable money, and a higher standard of living." [21] It is the task of labor market policy to balance supply and demand for labor among industries, regions, and occupations within the framework of a full employment economy. Labor market policy thus protects the security of the individual who might otherwise suffer hardship as the result of an economic policy aimed simply at overall balance in the national labor market. Both trade unions and employers reject as inflationary the view that wage policy should be used as a primary instrument of balancing supply and demand for labor. They prefer to use manpower measures to help in the adaptation of labor to structural changes in the economy. These include a well-informed and efficient employment service, generous facilities and subsidies for retraining adults, inducements to promote labor mobility and industrial location in areas with high unemployment, and public relief projects to provide work for the unemployed.

It is not necessary to review in detail Swedish manpower policy, as the United States has kept in close touch with labor market developments in Sweden and much has already been written on this subject.[22] We shall therefore devote this section to a brief outline of some of the more important programs, emphasizing recent developments which may affect Swedish manpower policy in the future.

The organization with overall responsibility for implementing Sweden's manpower policy is the National Labor Market Board. The Board has representation from the Swedish Employers' Confederation, the Swedish Confederation of Trade Unions (LO), the Central Organization of Salaried Workers (TCO), the Confederation of Professional Associations, agriculture, and female labor. It is interesting to note that the combined labor representation is larger than that of management on the Labor Market Board.

Advance Notice of Layoffs and Recruitment

By agreement between the Labor Market Board and employer organizations in manufacturing, trade, and forestry, private employers are required to report expected layoffs and discharges to the appropriate regional board authorities. Central government agencies are also obligated to report layoffs and terminations "well in advance." The employer's report gives the effective date of the layoff, the number of employees affected, expected duration, and reason for the layoff. As a rule, notice must be given 2 months before planned layoffs of more than 2 weeks or the shutdown of a plant, if at least 10 employees are affected. Short-term layoffs of less than 2 weeks, reductions in the workweek, and seasonal layoffs must also be reported "in ample time" before the effective date.[23]

In actual practice most companies give more than the required 2 months' notice of important layoffs. In a few cases this has resulted in workers starting to leave their jobs before the scheduled shutdown, but this has not been a major problem. The LO favors extending the advance notice period to 6 months.

In March 1965, the employers' organizations agreed to extend the 2 months' advance notice agreement to apply to recruitment involving 50 or more employees. Actually, such notice of new hiring has been given for some time because of the general shortage of manpower. The new agreement formalizes this practice.

In addition to the above notice to the public authorities, collective bargaining agreements generally prescribe that production workers are entitled to receive 7 to 14 days' notice and salaried employees 1 to 6 months' notice before dismissal.

The Employment Exchange

Sweden is considered to have one of the most effective employment services in Western Europe. It is accepted by both employer organizations and trade unions. Profitmaking private employment agencies are prohibited by law, but the Labor Market Board may license nonprofit agencies run by organizations. It is estimated that about one-third of all placements are made by the Employment Exchange, and it plays an important role in placements of manual workers and lower level salaried employees. Vocational guidance is greatly emphasized both in the schools and for persons in the labor force. Recently a major effort was launched to create a "new image" for the Employment Exchange. The offices were made more attractive, the number and competence of personnel were improved, and an intense publicity campaign was undertaken to reach the general public.

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[21] *Labor Market Policy in Sweden, op. cit.*, p. 20.

[22] See for example, *Lessons From Foreign Labor Market Policies*, Subcommittee on Employment and Manpower, 88th Cong., 2d Sess., U.S. Government Printing Office, Washington, 1964.

[23] *Labor Market Policy in Sweden, op. cit.*, p. 30.

Labor Mobility

Financial assistance to encourage labor mobility has been gradually increased since 1957. Allowances are available for workers moving to labor shortage areas to pay for travel, furniture transportation, and maintenance of two households during an interim period. In 1958 an allowance to permit one trip a month to visit his family was introduced for an unemployed person who moves but cannot immediately find family accommodations. In 1959 "starting help," presently amounting to Kr.500 ($100), was authorized for people taking work in another district. Persons who leave prematurely have to repay a proportionate amount of the grant. In 1962 special installation allowances of Kr.2,000 ($400) were instituted for people moving from districts with exceptionally high unemployment. By 1963 some 15,000 workers were receiving some kind of removal assistance as compared with 2,000 when the program was started. But most geographical movements occur without government support, and are stimulated by the Employment Exchange which provides nationwide information on job vacancies.[24]

A recent innovation started on an experimental basis in 1965, in districts of severe unemployment, pays expenses for job applicants to travel with their families to expanding areas. They may remain there for 1 week while seeking employment. The Employment Exchange provides lodging and arranges interviews with employers in the area. This is part of the drive to persuade workers to leave the northern counties and, more important, to stay in the new locations permanently. Experience indicates that labor turnover is high among migrating workers: About one-third return to their original residence within a year or two. Some move a second time, again with financial assistance from the Labor Market Board.[25]

The greatest obstacle to labor mobility and making a desirable adjustment in a new area is the shortage of housing. More than 90 percent of all housing in Sweden is supported by government loans. Municipalities may receive government loans for an increased number of dwellings on condition that, in allocating some of them, priority is given to unemployed workers from surplus labor areas and to persons with key positions in industry. The National Labor Market Board may also build temporary houses for single workers where there is a great demand for labor.

Unemployed workers sometimes have a problem selling their houses preparatory to moving to a new area. In the fall of 1964 the Labor Market Board was authorized, on an experimental basis, to buy a limited number of privately owned dwellings from unemployed workers who seek employment elsewhere. These houses will be offered for sale in the open market as "spare-time houses" or rented to the municipality.[26]

In contrast to trade unions in most other countries, the labor movement in Sweden strongly supports government efforts to induce workers to move from labor surplus areas. For reasons that will be discussed below, the LO as a rule prefers to have workers move rather than provide financial inducements for industry to locate in surplus labor areas.

Investment Reserve Funds

The investment reserve funds program is designed as an anticyclical device to level out business fluctuations by offering private companies appreciable reductions in tax liabilities. To benefit from the scheme, companies must set aside funds from otherwise taxable income, declaring them an investment reserve fund. Forty-six percent of this fund must be deposited at the Central Bank. If companies use their funds for investment at times designated by the government as desirable for anticyclical purposes, they can immediately write off the total amount of the investment, plus 10 percent, and have the deposit at the Central Bank released. Five years after the money has been set aside as an investment reserve fund, 30 percent may be used for investment and written off without authorization from the Board; in this case, the extra 10 percent writeoff does not apply.[27]

Industrial Location

The considerable migrations and adjustments in the Swedish economy have caused severe problems in the immigration as well as the outmigration regions, problems not unlike those encountered in other highly industrialized countries. The expanding areas suffer from shortages of various kinds (e.g., roads, communications, housing, and schools), while the regions with a rapidly declining population are finding it difficult to maintain satisfactory social welfare and local government services. These problems have been accentuated in Sweden in recent decades. Public measures in the field of location policy may be divided into two periods: Measures taken before July 1, 1965, and policies which govern industrial location after that date pursuant to a new act passed by Parliament.

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[24] *Ibid.*, p. 67.

[25] *OECD Management Seminar, op. cit.*, p. 117.

[26] "Reply From Sweden to Questionnaire by OECD Council on the Implementation of the Recommendation on Active Manpower Policy: Intentions, Procedure, Recent Progress," Stockholm: June 22, 1965 (Xerox).

[27] "Investment Reserves Regulations in Sweden," National Labor Market Board, Memorandum, Aug. 23. 1965 (mimeo).

Pre-July 1, 1965, Measures. In 1952 Parliament laid down certain principles to govern industrial location policies. These called for coordinating location policy with labor market policy to insure maximum utilization of available labor resources and to support the expansion of the economy in places with the lowest production costs (i.e., including the cost of secondary investments which fall upon the community). Special attention was to be paid to the depopulation of the countryside and the regions with a relatively large proportion of people employed in agriculture and forestry, as well as to the growth of Greater Stockholm. A special section was set up in the Labor Market Board to advise entrepreneurs on industrial location matters.

As pressures increased there was a gradual reinforcement of measures for implementing location policy.

Trade Associations. In each county a trade association was established to supply technical, administrative, and economic advice and information to small crafts and industries. Such associations could also lend government funds and handle applications for government credit guarantees for loans made in the regular credit market. Much of this activity was definitely aimed at influencing the location of industry. During the period 1954–65, government credit guarantees were issued for Kr.272 million ($54.4 million). As a result of the special grants and loans introduced on July 1, 1965, trade association lending and credit guarantee activities will be greatly curtailed.

Investment Funds. Between July 1, 1963, and July 1, 1965, investment reserve funds were able to be used to influence industrial location in the Northern Development Area. During this period permission was granted in 270 cases to use these funds, resulting in investments in machines and buildings of Kr.520 million ($104 million). This permission was terminated in 1965 under new legislation providing special aid for industrial location.

Public Relief Work. During 1963–65, industrial premises were authorized to be erected as public relief work, mainly in northern Sweden. To qualify for assistance, such work had to be undertaken by the local authority and then rented out to the enterprise at a rate based only on cost, with the company receiving an option to purchase the building. During 1963–65 public relief work was approved for the erection of industrial premises costing Kr.270 million ($54 million), to which government grants contributed Kr.100 million ($20 million). This investment was expected to lead to employment of an additional 10,000 persons. This type of assistance was abolished by the 1965 Act.

Retraining. An enterprise moving into or expanding in a labor surplus area can obtain a special training grant when employing inexperienced labor. Between 1960 and 1964, some 200 firms received grants totaling Kr.25 million ($5 million) for this purpose.

The Norrland Fund. When certain ore mines in the county of Norrbotten were nationalized in 1961, it was decided that Kr.15 million ($3 million) of the State's annual profit should be set aside for 5 years and used to promote economic development in northern Sweden. The fund is used mainly for research and development, but newly established or expanding enterprises are also financed by means of grants, loans, and guarantees against losses.

There are no definite data on the combined effect of the above measures on the location of industry. A survey of newly established or relocated enterprises with at least 25 employees showed that 800 enterprises, employing 65,000 employees in 1961, were located in the period 1946–61. Of these, 134, with 17,000 employees, had been moved out or established as subsidiaries from the major conurbations (Stockholm, Gothenburg, Malmö). During the same period, 147 enterprises, with 9,000 employees, were established in these conurbations. The newly established and relocated enterprises were set up in many parts of southern and central Sweden, but remarkably few in the north. It is not known to what extent public agencies assisted in their location.

Industrial Location Policy Since July 1, 1965. In 1964 Parliament passed an act, based on recommendations of a Royal Commission, laying down "new directions" for industrial location policy for a 5-year period starting July 1, 1965.

1. Action is to be concentrated in districts with good development potential and suitable conditions for industrial activity. Public measures should be confined chiefly to outlays for schools, hospitals, communications, and other public services. Investments undertaken to improve conditions for industry must be based upon a realistic analysis of profitability, with the aim of creating or maintaining urban areas having services or functions that make them viable in the long run.

2. At least for a trial period, direct financial assistance for industrial expansion will be limited to urban communities in the sparsely populated counties which can serve as social and commercial

centers for the population in the surrounding countryside.

3. In places where measures to stimulate labor mobility cannot resolve employment problems, public action to promote location of industry may be economically justifiable as the only means of using available labor productivity. It is obvious, however, that public support is feasible in only a limited number of cases. Migration of population from rural districts and small urban communities will continue, making it more difficult to maintain acceptable public services for the remaining population. Other action will be necessary to ensure reasonable services in these areas.

4. Advisory and information service to enterprises is one of the prime means by which the community can influence the location of industry. The Labor Market Board is also expected to contact firms on its own initiative and encourage them to settle in labor surplus areas.

5. State aid for the location of industry is to be granted primarily within the Northern Development Area, which covers two-thirds of Sweden, but has a population of only 1.3 million—about 17 percent of the country's total population. Only in exceptional cases should government assistance be given in other areas.

6. Support is to be concentrated in places where (a) it is most urgent for society that development be stimulated; (b) industrial activities are likely to thrive; and (c) community services can find a convenient center.

7. Assistance is intended to help firms start or extend operations, but not to subsidize subsequent operating costs. One of the conditions is that investments have a lasting favorable effect on employment.

8. Government assistance should be given in the form of grants and loans for the erection, conversion, and extension of industrial premises. Loans may also be granted for the purchase of machinery, equipment, and tools and for tourist accommodations. In principle, government loans and grants are intended to supply the remaining capital after the enterprise has made its own investment and obtained loans in the credit market. Parties other than the government, including the entrepreneur himself, are expected to share the risks involved.

9. Government assistance may not as a rule exceed two-thirds of the total investment in building and machinery. Grants are limited to a maximum of 35 percent of the investment in building, though in exceptional cases the limit may be set at 50 percent.

10. Considering the collaterals pledged, the interest on loans for industry location is lower than the market rate. In special cases exemption from interest may be granted for a maximum of 3 years. The period of amortization is 10 years or, in special cases, 20 years, and exemption from amortization may be granted for a maximum of 5 years.

The new policy is regarded as an experiment covering a 5-year period. It is financed by Kr.300 million ($60 million) assigned to grants for industrial location and Kr.500 million ($100 million) to loans.

The central agency for industrial location is the Labor Market Board. It can make decisions on assistance in the Northern Development Area on projects costing less than Kr.3 million ($600,000). Other cases are decided by the Ministry of the Interior on recommendation from the Labor Market Board. A Committee on Location, with representation from government, business, and labor, serves as a coordinating body and maintains surveillance over the operation of the program. The government is expected to work closely with the counties in administration of the industrial location program.[28]

The trade union movement takes a dim view of policies to promote industrial relocation. It considers the measures as politically motivated and often economically unsound. Some people believe that the new proposals were motivated by the concern of the Social Democrats over the loss of popular support in the north. Opponents of industrial relocation point out that these programs are relatively expensive and that often the companies receiving assistance are poor risks. They argue that Sweden needs to have larger enterprises in order to take advantage of automation and modern technology. This calls for concentrating firms in a few areas with a population large enough to provide the necessary services and a diversified labor force. Communities of less than 20,000, it is argued, cannot support enterprises on this scale. There is a feeling that if a location is economically sound, industry will go there without financial subsidies. The LO also fears that firms attracted by financial inducements to locate in labor surplus areas will be marginal, inefficient producers who will pay relatively low wage rates.

There is also some concern over municipalities competing with each other to attract industry by offering financial help. Every community wants to survive, almost regardless of cost and national interest. Communities, therefore, tend to oppose labor mobility because it drains the community of its youngest and best human resources, leaving behind an older, declining population to bear the increasing costs of running the community. The LO feels strongly that whatever help is offered to induce industries to locate in northern counties should be given through the central government and not at the community level, so that national rather than local interests will predominate.

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[28] "Industrial Location Policy in Sweden," Ministry of Labor and Housing, October 1965 (mimeo).

The case for industrial relocation policy is that depopulation of areas with high unemployment leads to a vicious circle, as the exodus only reduces employment opportunities for those who remain. Thus the decline in population may lead either to a reduction of public investments or to a higher cost of investment per inhabitant, which may discourage private industry from investing even if there is sufficient manpower in the area. This, in turn, will be a reason for increased migration out of the area.[29]

Employment Planning in Construction

A large proportion of those unemployed during the winter are building workers. It is the responsibility of the County Labor Boards to see that employment in construction is distributed as evenly as possible throughout the year. Since experience has shown that it is difficult to improvise measures against unemployment, a reserve of municipal and state projects is prepared, to be drawn on in the event of a decline in employment.

During the 1950's controls over construction were gradually relaxed. Since 1959 there has been no limitation on construction except for controls aimed at reaching a seasonal balance in building activity. County Labor Boards decide when the work is to be started, taking into consideration seasonal demand and also ensuring that older workers are given opportunities for employment. According to a parliamentary resolution, even these controls are to be gradually reduced and replaced by a system of local employment planning by joint committees made up of employer, worker, Labor Market Board, and municipal representatives. Under the new policy, maintaining a seasonal balance becomes a matter of voluntary cooperation between these parties. However, the government is authorized to reintroduce building controls if the voluntary measures fail to create a seasonal balance.

Emergency Works

Emergency works are started when unemployment cannot be successfully controlled by other measures; e.g., migration, retraining, location of new industries, or expansion of ordinary public activities. County Labor Boards estimate the current need for emergency work. In order to make preparations in time, the boards make a preliminary forecast in May on the demand for employment-creating measures during the next fiscal year.

During the past few years, emergency works have been used mainly as a weapon against seasonal fluctuations in the labor market. Employment on emergency works has been several times greater during the winter than in summer. The major part of these projects has been located in the northern provinces, and two-thirds of the cost of emergency works in recent years have been for public roads.[30]

The Swedish Employers' Association has been critical of the public works program on the following grounds:

1. Roadbuilding today is a highly mechanized business which provides relatively little employment in relation to costs. The cost per unemployed person per day is Kr.400 ($80). This kind of work also calls for the use of a considerable number of skilled workers (about 20 percent) who are rarely found among the unemployed. Furthermore, productivity on public works is for various reasons lower than that of similar work carried on in the normal way.
2. An unduly large proportion of public works is assigned to unemployment districts. As a result there is considerable road building in northern Sweden, while southern and central Sweden, which have a greater need for good roads, are neglected.
3. Public works predispose the population to remain in the unemployment districts rather than move. Thus these projects tend to conflict with the government's policy to induce labor mobility out of labor surplus areas.

The Employers' Association favors holding public relief works to a minimum and putting greater emphasis on geographical and occupational mobility. However, it recognizes that political pressure favors these projects as a means of "inducing people to stay where they are," and therefore does not expect any significant change in this policy in the near future.[31]

A representative of the National Labour Market Board makes the following observations with regard to the above criticism:

1. Since 1958–59, when Sweden experienced an economic recession, the public roads portion of emergency works has fallen from 63 to 35 percent of the total.
2. In southern and central Sweden, emergency works have been largely used to employ persons who are difficult to place in the open market or for unemployed workers from the North. For the latter group, emergency works help to channel these workers into the open market.
3. One-third of all emergency works jobs are filled by people who are physically or mentally handicapped or who are difficult to place in regular employment because of old age or local ties (e.g., care of relatives, etc.).[32]

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[29] *Labor Market Policy in Sweden, op. cit.*, p. 54.

[30] *Ibid.*, pp. 37–41; "Employment Planning in Swedish Building Activity." National Labor Market Board, Memorandum, May 1964 (mimeo).

[31] *OECD Management Seminar, op. cit.*, pp. 115–116; also letter from Labor Market Board, *op. cit.*

[32] Letter from Labor Market Board, *op. cit.*

Unemployment Insurance

Voluntary State-supported unemployment insurance has existed in Sweden since 1935. There are about 40 unemployment insurance funds organized on a national basis by trade unions and subject to approval by the National Labor Market Board. These funds are also open to nonunion members, "homeworkers," and self-employed persons. Membership in a fund is generally compulsory for union members.

Membership in unemployment funds varies with union membership in different occupations. The percentage of members is highest in mining, manufacturing, and building, and lower in commerce, communications, and agriculture and allied occupations. In government, only about 15 percent of all employees are covered and there is no unemployment fund for domestic workers. In 1965 membership in unemployment insurance funds was about 1.6 million out of a labor force of about 3.5 million. A representative of the Labor Market Board points out that those not covered by unemployment insurance are largely civil servants and others with little or no risk of unemployment, individuals who do not work enough to be eligible for membership, and students who do only casual work.[33]

Unemployment insurance is financed by contributions from insured persons, and by State grants in approximately equal amounts; employers do not contribute. Benefits are payable up to 30 weeks and aim at paying about 50 to 75 percent of earnings. However, the Kr.20 ($4) per day ceiling, exclusive of dependents' benefits, probably results in average benefits below 50 percent of earnings. There is discussion about increasing the maximum benefit to Kr.40 ($8), which, if adopted, would raise the average considerably. Government cash assistance, on the basis of a means test, is available to persons exhausting insurance benefits or not covered by insurance. In 1962, government expenditures for unemployment insurance were 0.2 percent of national income, which was lower than in any of the Common Market countries except France and Luxembourg (which contribute nothing) and the United Kingdom and the United States. Total social security expenditures in Sweden, at 9.2 percent of national income, were exceeded by all Common Market countries and the United Kingdom; only the United States, which spent 4.8 percent of national income, was lower than Sweden.[34]

The Swedish approach to unemployment insurance appears to be subject to improvement. Despite the observation of the representative of the Labor Market Board, coverage appears inadequate; the absence of employer contributions is also questionable. We were told that some unions tend to prefer the present system because it permits them to use reserves in the unemployment insurance funds for other purposes; e.g., housing. As long as unemployment is very low, the system seems to work well. However, it does not seem adequate for an industrialized country with an active manpower program and an advanced system of social security such as Sweden.

Old-Age Pensions

The basis of Sweden's pension system is the national old-age pension which is paid to all Swedish citizens and foreigners resident in Sweden for a certain period from the age of 67. This pension is not related to income. It amounts to Kr.4,225 (849) per year for a single person and Kr. 6,630 ($1,326) for a married couple (about 30 percent of the average income of a skilled male worker in industry, and 40 percent if the spouse is also a pensioner). Increases are scheduled for 1966 and 1968. This system is financed chiefly by the central government budget and, in certain cases, is supplemented by municipal housing allowances.

Besides the basic pension, an increasing number of people are becoming entitled to the national supplementary pension, known as ATP, which became effective in 1960. The national old-age pension and ATP together will equal roughly two-thirds of the yearly income earned during the pensioner's 15 highest paid years, up to a maximum earning of Kr.39,750 ($7,950). ATP will come into full force for persons reaching pensionable age (normally 67) in 1981. Both the national pension and ATP are adjusted from time to time for changes in the consumer price index. The ATP premiums which are calculated only for income between Kr.5,300 ($1,060) and Kr.39,750 ($7,950) per year are paid by employers. Retirement between 63 and 67 is possible with reduced pension benefits. Persons postponing their pensions until after age 67 receive higher benefits.

The present pension schemes have largely replaced private programs which existed earlier. Thus the right to an adequate pension has been made independent of an employee's not changing his place of work. There also appears to be no restriction on an employee's right to continue working and receiving his full pension after age 67, thus encouraging older workers to remain in the labor force if they wish.[35] In 1960, 27 percent of all men and 5 percent of all women over 65 years of age were employed. The male figure was about the same as for the United States but higher than for the Common Market countries included in the study; the female percentage was lower than that in any Common Market country except the Netherlands.[36]

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[33] *Ibid.*

[34] *European Social Security Systems,* Joint Economic Committee, 89th Cong., 1st Sess., U.S. Government Printing Office, Washington, 1965.

[35] *Some Data About Sweden, op. cit.,* p. 96.

Vocational Guidance

According to school reforms presently underway, a 9-year comprehensive school starting at age 7 is being made the general rule in Sweden. Previously, pupils were divided between elementary and grammar school after the fourth or sixth school year. A great deal of vocational guidance is given in the highest forms, and form 9 is divided into a number of tracks, one of which is for preparatory vocational training in different fields.

In Sweden great importance is attached to helping students choose the "right" occupation and close collaboration exists for this purpose between education authorities, labor exchanges, and industry. During the last 2 years of school, pupils are placed in various undertakings for about 2 weeks.

The OECD examiners suggested that more emphasis should be given to psychological testing as part of vocational guidance. The Swedish delegation acknowledged that psychological tests had been neglected in the past but noted that they are being used more now.[37]

The problem of "functional illiterates" is practically unknown in Sweden, except for a very small number of gypsies and Laps. There are many persons with 7 or 8 years of schooling who are apparently absorbed into industry without difficulty. Apprenticeship plays an unimportant role in vocational training, as young workers generally get their training in full-time vocational schools or in industry.

According to Dr. Gordon, the Swedish approach to vocational training may be partially responsible for their relatively high unemployment rates for teenagers, especially girls, which is also found in France but not in West Germany and Great Britain, where apprenticeship and on-the-job training are important.

> A young person leaving a technical or commercial school tends to go through a period of joblessness before he gets his first job, and, like the young worker in the United States, is likely to experience a number of job changes before he settles down in a relatively permanent job. Moreover, both France and Sweden have been experiencing a bulge in their teenage populations and associated problems of inadequate capacity of their vocational training schools.[38]

Retraining for Adults

Adult training occupies a central role in Swedish labor market policy. The program has progressed from 55 courses in 14 trades for 634 workers in 1957 to 776 courses in more than 100 occupations for 40,000 workers in 1964. The 1964 figures include a large portion of publicly supported training within industry, which is increasing. Thus the stated objective of training 1 percent of the labor force each year has been met and surpassed if training within industry is included. Training periods range up to 22 months and average about 5 months each. Mechanical engineering, electromechanical trades, and occupations allied to the motor industry predominate.

Trainees receive Kr.410 ($82) per month and may also qualify for rent and family allowances. These payments usually amount to about two-thirds of average earnings and, for persons with several dependents, may reach the average wage for unskilled labor. The program was originally limited to handicapped unemployed, who were particularly difficult to place in their former occupations. Later all unemployed were declared eligible for retraining. Now eligibility has been widened to include persons in firms about to close down, persons who are particularly difficult to place (e.g., older workers), housewives desiring to enter the labor force, and "small holders" wishing to leave farming for industrial jobs.

There is considerable support among trade union and government officials for extending retraining (and also removal) grants to employed persons who wish to upgrade their skills. This extension has been opposed by employers.[39]

The Swedish retraining program has often been held up as a model for other countries. It is described in detail in Dr. Gordon's study for OMAT.

Government Expenditures

The OECD examiners raised the question "whether . . . work could not be brought to the worker to a greater extent than at present."[40] In reply the Swedish delegation noted that "the financial and administrative efforts to bring jobs to workers are many times greater than those devoted to improving mobility, though the latter have been most rapidly increased during recent years."[41] Figures to support this contention are presented in table 15.

In fiscal 1965–66 the government planned to spend almost Kr.1 billion ($200 million) on labor market activities. This represents about 4 percent of total central government expenditures. If the United States were to spend a similar proportion of the national budget on labor market activities, we would be spending about $4 billion. Sweden's expenditures on labor market activities have increased eightfold during the last decade and have doubled since 1960. A breakdown by activities is shown in table 15.

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[36] *Yearbook of Labor Statistics, 1964*, International Labor Organization, Geneva, table 3.

[37] *Labor Market Policy in Sweden, op. cit.*, pp. 56–57.

[38] M. S. Gordon, *Retraining and Labor Market Adjustment in Western Europe*, Office of Manpower, Automation, and Training, U.S. Department of Labor, August 1965, p. 93.

[39] *OECD Management Seminar, op. cit.*, p. 112.

[40] *Labor Market Policy in Sweden, op. cit.*, p. 54

[41] *Ibid.*

The figures in table 15 show that while "employment-creating measures" are by far the largest item in the labor market budget, expenditures for geographical mobility, retraining, and measures to help the disabled have grown much more rapidly during the last 5 years. It is interesting to note that in a full employment economy, such as exists in Sweden, so much is being spent on emergency works and other measures designed to provide work for the unemployed. In the United States we would have to spend about $1.6 billion on public works and similar measures to appproximate Swedish expenditures as a percentage of our total national budget.

TABLE 15. EXPENDITURES ON LABOR MARKET ACTIVITIES IN SWEDEN, 1955–66

Activity	In 000,000 kronor		
	Fiscal 1955–56	Fiscal 1960–61	Fiscal 1965–66
1. Administration (salary and expenses)	33	49	100
2. Geographical mobility (grants for travel, starting help, family allowances, etc.)	--------	6	40
3. Retraining and further training	3	71	145
4. Measures for disabled people (vocational assessment, work training, sheltered employment, public emergency works, etc.)	6	40	165
5. Employment-creating measures (emergency works, extra government orders, grants for advance planning of municipal building, and construction projects)	44	277	395
6. State-supported unemployment insurance	38	65	84
7. Industrial location subsidies	--------	--------	60
8. Miscellaneous	1	2	4
Total	125	510	993

SOURCE: "Reply from Sweden to Questionnaire by OECD Council on the Implementation of the Recommendation on Active Manpower Policy: Intentions, Procedure, Recent Progress," Stockholm, June 22, 1965 (Xerox).

Recommendations for Improvement

There is a great deal of self-criticism in Sweden about the lack of research on the effects of labor market policies. An LO economist noted that "there is hardly any material available elucidating . . . the situation of the firms or the individual worker in an expansive and continually changing economy. Of course, the lack of such research material has a hampering effect on the further development of the 'new' labor market policy."[42] An LO team of economists and sociologists, which visited the United States in spring 1965, were tremendously impressed with the relatively large research budget built into the OMAT appropriation and at the amount and quality of research on manpower being carried on in universities. In this one area—research—the United States is acknowledged to be far ahead of Sweden as well as the other countries we visited.

Despite having what most observers regard as the most comprehensive and effective labor market program in the world, Sweden itself is not content. A 1965 Royal Commission report recommended the following improvements:

1. Reinforce the employment exchange and provide more vocational guidance for adults and workers needing rehabilitation.
2. Provide government grants for retraining within firms. A majority of the Commission favored retraining for employed as well as unemployed.
3. Increase moving grants and make such grants available to others than unemployed in certain areas with high unemployment.
4. Continue the shift of flat production in favor of expanding localities and give priority in housing queues to unemployed workers who move.
5. Increase public investments before a recession develops; pay more attention to the profitability aspect in choosing among public works projects, even if this results in not giving preference to areas with the largest amount of unemployment.
6. Improve unemployment benefits paid by municipalities.
7. Devote more public works to employment of the handicapped, and increase resources for training, sheltered employment, and self-employment of handicapped people.[43]

An LO economist presently doing work for the National Labor Market Board gave the following critique of Swedish labor market policy:

> Summing up, it may be said that the selective methods of the labor market policy continue to be dominated by traditional measures and that the fresh features of an "active" labor market policy stand out as relatively restricted and tentative. The lack of objectives guiding the labor market policy, together with the too sparse analyses of the effects of measures used, has contributed in making the practical policy appear overestimated to some extent.
>
> The foregoing presentation of Swedish labor market policy has been a critical commentary. That is so because the popular notion of this policy as something "streamlined" and complete ought to be modified into a more realistic conception. The aim of this presentation, moreover, is to point out the urgency of taking on a quantitative and qualitative reassessment of the Swedish labor market policy without further delay, fixing the objectives more clearly than hitherto and making more sober-minded analyses of the many in-

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[42] P. Holmberg, on Sweden, in *International Trade Union Seminar on Active Manpower Policy: Supplement to the Final Report*, Vienna, Sept. 17–20, 1963, OECD, p. 173.

[43] "Reply From Sweden to OECD Questionnaire," *op. cit.*

tricate problems involved. It may be said without any exaggeration that most of the work in Swedish labor market policy is still to be accomplished before it is fully adapted to the society of full employment and rapid development.[44]

There is always room for improvement and Sweden's striving for excellence is commendable. However, most countries have a long way to go to reach Sweden's present level of achievement in manpower policy and can learn much from the Swedish experience.

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[44] *OECD Trade Union Seminar, op. cit.*, p. 174.

Chapter 6. The Netherlands

By American standards, the Netherlands has had an enviable growth record during the past 15 years: Gross national product rose at an average rate of about 5 percent per year and productivity per worker increased by 3.7 percent annually. Unlike other West European countries, the labor force maintained a high annual growth rate averaging 1.3 percent over the entire period—about the same rate of increase as in the United States. Furthermore, the Netherlands expects its labor force to continue to grow at about the same rate during the next 5 years; this is two or three times the projected increase in the other four countries studied, though well below the anticipated average increase of 1.8 percent per year in the United States. Unemployment, at 0.7 percent of the labor force in 1964, was lower than in any other West European country with the possible exception of West Germany.

Factors Affecting Technological Progress

Despite the growth experience noted above, employer and government representatives believe that technical progress has been too slow in the Netherlands. Employers with whom we met said that investment in machinery and equipment has tended to be extensive rather than intensive, and that in general, Dutch management is inclined to be conservative regarding the use of automation and advanced technology. There was also a feeling, even among employers, that relatively low wage levels have served as a brake on installation of laborsaving equipment. A study by the Swedish Employers' Confederation found that total male wage costs in manufacturing in 1964 were lower in the Netherlands than in any of the other countries included in this report.[1] Other factors cited as obstacles to automation were the prevalence of small- and medium-size firms, the limited size of markets which precludes taking advantage of certain kinds of automated equipment, and a shortage of specialized technical manpower who are knowledgeable about the installation and use of modern technology.

But factors which should speed up automation of both office and production processes have been changing the situation in recent years: Wages have been rising at a more rapid rate; the agricultural labor force, which, in the past, has been an important source of labor for expanding industry, has been reduced to less than 10 percent of the total; and employable unemployed workers are almost nonexistent. Furthermore, strong traditions and social policy in the Netherlands, more than in most countries, will probably preclude any significant increases in the proportion of working women, overtime work, prolongation of working life beyond 65, or use of foreign labor.

Office automation, especially, is expected to increase rapidly. Dutch employers and government have from the outset been enthusiastic users of computers. At the end of 1961 the number of computers installed per million nonagricultural workers was higher than in any other European country, with the exception of Sweden and Switzerland.[2] By 1964 the Netherlands had 164 computers and were expected to have about 600 by 1974.[3] (This figure is considered too low by a knowledgeable Dutch informant who believes that by 1970 the Netherlands will have more powerful computers of the "third generation" with a total capacity equal to about 950 computers of the present "second generation."[4]) The largest user of computers is the Netherlands Postal, Telephone and Telegraph Department (PTT) which, in November 1965, had 25 in operation[5]—a threefold increase over the number in use at the beginning of 1964. The Philips Co., manufacturer of a wide range of electrical products, has 14 computers in the Netherlands out of a total of 37 in operation in its branches in all countries.[6]

There is a trend towards smaller companies forming cooperative groups to make use of computers which are too expensive for one company to buy or rent. The interest in and knowledge about computers has been increased by the activities of the Netherlands Automatic Information Processing Research Center in Amsterdam, which is supported by both industry and government. The center maintains an extensive reference library on administrative automation, publishes special studies and regular bibliographies, trains programers and systems analysts, conducts conferences for business executives, and generally serves as a positive influence for extending knowledge and use of office automation in the Netherlands.

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[1] *Direct and Total Wage Costs for Workers: International Survey, 1957–64*, Swedish Employers' Confederation, Stockholm, December 1964.

[2] *Development of the Computer Market in Europe*, Netherlands Automatic Information Processing Research Center, Amsterdam, June 1963.

[3] See chap. 4.

[4] Letter from H. Reinoud, director, PTT, Nov. 25, 1965.

[5] *Ibid.*

[6] Letter from E. Plug, N. V. Philips Co., Nov. 26, 1965.

Industries which are relatively advanced in the use of automation for production purposes include fertilizer plants, petrochemicals, textiles, and electronics. There are only a few numerically controlled machine tools in use. The largest employer in the Netherlands, the Philips Co., has embarked on a reorganization of its production facilities which should result in more widespread use of automation not only in the Netherlands where it has its headquarters, but also in other European countries. After the war, Philips decentralized and placed all decisions regarding production, planning, and distribution in its individual country operations. Production in each country was geared primarily to national markets. In recent years, as a result of the development of highly sophisticated information systems, operations research techniques, and the Common Market, there is a tendency towards greater centralization, with plants specializing in production of particular products for the world market. This should increase opportunities for automation, especially where large-scale production and long runs are necessary to reap the advantages of modern technology.

The government has also become interested in the prospects and problems of automation, and a special committee has been appointed to investigate the progress and effects of automatic processes in the Netherlands and other countries.

Attitudes Towards Unemployment, Work, and Leisure

Despite a current unemployment rate of less than 1 percent and an almost uninterrupted record of full or overfull employment during the postwar period, the concern over dismissals of almost any kind is very great in the Netherlands. Employers readily admit to keeping workers on the payroll for fear of public reaction if they dismissed them, and companies generally promise that no dismissals will occur as a result of introduction of new equipment.

Dutch employers have a feeling of social responsibility for maintaining employment. A representative of the Philips Co. said that his concern has never dismissed an employee as a result of office automation. The strong public antipathy to dismissals can create important problems for an employer. One employer cites the case where his company let some employees go who were no longer needed. One and one-half years later the company needed to recruit new employees for expansion of operations but could not fill its requirements because its reputation had been tarnished as a result of the earlier layoffs.

As a result of office automation in the GIRO (postal check) operations, the PTT has reduced employment from 6,500 to 4,500 since 1961. It had promised no dismissals of full-time people, but some 400 part-time employees were laid off and 150 were transferred to other PTT services. About 300 full-time employees were continued in various capacities, though they no longer were required. Despite an anticipated increase in activities, the PTT expects to reduce employment further, to 3,000 employees, in its GIRO operations over the next 5 to 10 years. The reduction is being carefully planned. All employees are being interviewed by a social psychologist to determine how they feel about automation and to help them adapt to the new operations. The objective is to make the PTT "independent of the labor market" because of the extreme labor shortage, particularly of white-collar employees, which exists in the Netherlands.

Regulation of Dismissals

Employers and employees are prohibited from terminating employment without the consent of the Employment Service, except in cases of mutual agreement or for reasons of an "urgent nature," which are defined by law and result in instant dismissal. This law enables the government to exercise a regulatory function in the labor market. During periods of high unemployment it can be used to protect employees against dismissal, and in a tight labor market it can be administered in such a way as to curb excessive turnover. Employer and employee representatives and the Labor Inspection Board, which is responsible for ascertaining the facts in each case, are consulted before a decision is made on every application to dismiss employees or to terminate employment.

An employer representative acknowledges that in practice the law "has contributed towards peace on the labor market, without materially affecting normal conditions." He also states that the law has not been used to force employers to keep employees "in the case of genuine redundancy," or to compel an employee to stay with an employer against his personal wishes. Nevertheless he asks whether such a law, "however useful it may have proved in practice, is not assailable in principle."[7]

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[7] *International Management Seminar on Active Manpower Policy: Supplement to the Final Report,* Brussels, Apr. 14–17, 1964, Manpower and Social Affairs Directorate, OECD, Paris, 1964, p. 96.

Unions have recently asked for repeal of this law as a necessary concomitant to a free wage policy, which they favor.

There was considerable disagreement among people we interviewed in the Netherlands as to how much use is actually made of this law in practice. Some people considered it more or less a "dead letter," especially with regard to permission for employee termination; others could point to instances where dismissals had been delayed or even disapproved. Unpublished statistics for the period 1953–64 show that management requests for dismissal permission involved about 25,000 workers each year, with a peak of 57,000 in the recession year of 1957. Requests by employees to terminate employment averaged about 15,000 per year, reaching a low point of 7,000 in 1957. About 85 percent of the employer and 65 percent of the employee requests were approved by the Employment Service. It is possible that this represents only the initial action and that requests disapproved on the first application may subsequently have been approved. At any rate this law, as in the case of dismissal laws in France and to a lesser extent in West Germany, would appear to represent a potentially powerful weapon which can be employed by government to regulate the labor market.

In addition to requesting permission before dismissal, an employer is also required by law to give workers notice before dismissal ranging from 1 to 13 weeks, depending on length of service. Dutch workers are not normally given time off to seek other employment during the notice period as they are in some countries.

Under the law discussed above, recruitment of new employees can also be regulated in the Netherlands. This provision, which has rarely been invoked, authorizes the Minister of Social Affairs and Public Health to make the recruitment of certain kinds of workers dependent upon permission from the director of an area Employment Service office.

Unemployment Insurance and Old-Age Pensions

Employers, employees, and the State contribute to unemployment compensation. Benefits amount to 80 percent of average earnings during the 13 weeks prior to becoming unemployed plus children's allowances for a period up to 26 weeks per year. Needy unemployed exhausting benefits are eligible for social assistance.

The cost of old age, disability, and survivors' insurance is borne mostly by the insured, who pay 10.2 percent of net income, up to a maximum of 12,000 gulden ($3,240) a year; employers contribute 1.5 percent of payroll up to the same maximum; and the government pays premiums for low-income pensioners and makes up any deficit in the system. As of January 1, 1965, full pensions of 3,760 gulden ($1,015) per year were payable at age 65 to a married man; a single person received 2,628 gulden ($710). These pensions are adjusted twice a year for changes in the wage index.[8] They represent about 50 and 33 percent of average annual earnings for married and single male workers, respectively, in manufacturing in 1964.

Despite the fact that a person may receive a full pension even if he continues to work, very few people over 65 remain in employment. Individuals are expected to retire when they become eligible, and there is little effort on the part of industry or the government to persuade people to continue working to help alleviate the severe labor shortage. In 1960, only 20 percent of all men and 3 percent of all women over 65 were in the labor force. These proportions were lower than in most other West European countries and in the United States. Only France had a lower male over-65 participation rate of 19 percent.[9]

Women in the Labor Force

The working population in the Netherlands was only 36 percent of the total population in 1960, the lowest proportion in Western Europe and one of the lowest in the world. This is explained largely by the low labor force participation rate of women in the 20–64 age group—21 percent as compared with a range of 36 to 45 percent in the other four countries and the United States. It is interesting to note that 59 percent of women aged 15–19 were in the labor force: [10] a relatively high proportion, which indicates that the Dutch have no objection to young unmarried women working.

Until recently the government made no great effort to persuade married women to enter the labor market or return to work after their children were of school age. In the last few years, however, the government has increased its efforts to induce married women to enter the labor force. As of January 1, 1962, a change in the tax laws exempted from income tax one-third of the earnings of working wives up to 2,000 gulden ($540), with a minimum exemption of 500 gulden ($135).[11] While this change apparently was not specifically directed at attracting more women into the labor force, it is expected to have a positive effect on the participation rate of married women. Private firms are also adopting practices designed to make work as attractive as possible for married women, including offering of part-time work.

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[8] *European Social Security System*, Joint Economic Committee, 89th Cong., 1st sess., U.S. Government Printing Office, Washington, 1965; and letter from U.S. Labor Attaché, The Hague, Dec. 1, 1965.

[9] *Yearbook of Labor Statistics, 1964*, International Labor Office, Geneva, 1964. The French figure is for the year 1964.

[10] *Ibid.*

[11] Letter from U.S. Labor Attaché, *op. cit.*

Given the strong Dutch tradition against married women working, it may take some time before these measures begin to have any significant effect, if indeed they are successful at all in achieving their objective.

Hours of Work

The normal workweek is 45 hours and there is very little overtime worked. In order to work his employees overtime an employer must obtain permission from the government and, in some cases, he must also consult the Works Council or the union. Even then workers may sometimes refuse to work overtime. However, some collective agreements require employees to accept overtime work under certain specified conditions. The first 2 hours of overtime worked are paid for at a premium rate of 25 percent, and additional hours at 50 percent. Saturday work after 6 p.m. and Sunday work is paid at double time. Shift work is also very unpopular. In short, the attitude of the typical Dutch worker is that evenings and weekends are supposed to be spent at home with his family. Anything which interferes with this way of life is frowned upon and avoided whenever possible.

Collective Bargaining

There are three major labor federations in the Netherlands which together have organized about one-half the eligible Dutch workers. The Netherlands Federation of Trade Unions (NVV), which is the traditional Socialist union in the country, has about 526,000 members; next in size is the Catholic Workers' Movement (KAB) with 407,000 members; a third federation, distinctive to Holland, is the Protestant Labor Federation (CNV), with 230,000 members.[12] Communist unions, which were fairly important immediately after the war, have been of no consequence since about 1950.

Employers are also organized into Catholic, Protestant, and nondenominational groups. The Netherlands Employers' Federation and the Central Social Employers' Federation—the two nondenominational groups—complement each other, one dealing with "economic" matters, the other with "social" questions. They have a considerable overlapping of membership and together represent employers with about 80 percent of total employment.

Wage policy is formulated on a national basis by the Foundation of Labor, a bipartite organization made up of representatives of the various labor groups and employer associations. It also serves in an advisory capacity to the government on all questions of social and economic policy. The foundation has an interesting history, having developed out of a clandestine organization of bona fide unions and employer organizations formed during the German occupation.

After the war the Netherlands had a rather rigid system of wage controls administered with the cooperation of labor and management, which broke down in 1962. Since then wages have risen rapidly, with the 1964 increase approximating 10 percent. Negotiations are conducted at the national level between union and employer organizations, but collective wage agreements must be approved by a government body called the Board of Mediators.[13]

Unions have shown little interest in automation, and job security issues have not played an important part in collective bargaining. An American professor, who spent a year in the Netherlands studying labor-management relations, said that the subject of automation was never raised in any of his discussions with trade union leaders. Recent demands have emphasized wages, reduction in the workweek from 45 to 42¼ hours, and increased vacations with pay. In addition to their normal wages, Dutch workers also receive extra pay, generally 4 percent of annual earnings, to cover the added expense of taking a vacation.

Dutch unions are not militant and official strikes are a rare occurrence, though unofficial strikes are more frequent. Working days lost due to labor disputes were 0.7 per 1,000 inhabitants in 1962 and 3.1 in 1963, the lowest in Western Europe. Comparable figures in other countries for 1963 were United States, 84; France, 124; United Kingdom and West Germany, 33. Only Sweden and Denmark, with 3.3 and 5 days lost per 1,000 population in 1963, came close to the Netherlands on this measure of "labor peace." Over a longer and more representative period; e.g., 1954–63, the Netherlands still ranks toward the bottom among European countries on time lost due to strikes, but its record is not quite as good as that of Sweden and Switzerland and about on a par with West Germany.[14]

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[12] *Directory of Labor Organizations—Europe*, vol. II rev., U.S. Department of Labor, May 1965.

[13] For a more detailed discussion of Dutch wage policy, trade unions, and collective bargaining, see: J. Pen, "The Strange Adventures of Dutch Wage Policy," *British Journal of Industrial Relations*, October 1963, pp. 318–330; W. Galenson, *Trade Union Democracy in Western Europe*, University of California Press, 1961; M. P. Oettinger, "Job Evaluation in the Netherlands," *Industrial Relations*, October 1964, pp. 45–59.

[14] *Yearbook of Labor Statistics*, International Labor Office, Geneva, various years.

Government Manpower Programs

Planning

In a paper prepared for an OECD meeting, an employer representative listed the following five "aims of social and economic policy" which are accepted by the government: (1) maintenance of full employment; (2) equilibrium in the balance of payments; (3) a capital investment level which will gradually raise the standard of living; (4) an acceptable distribution of income; and (5) a stable price level.[15] These aims represent the position of the Social Economic Council on national planning objectives during the last 10 years.

While he did not say that the list was in order of priority, the relative placement of full employment and price stability is of particular interest.

The task of developing policies to meet these objectives belongs to the government advised by the Central Planning Bureau, which develops an econometric model of the economy for the coming year; the Social Economic Council, a tripartite group which advises on social and economic policy, including manpower; and the Foundation of Labor, which consists of trade union and employer representatives with responsibility for setting wage policy. Up to now, projections based on an econometric model of the economy have been made for only 1 year ahead. However, forecasts on a 5-year basis are scheduled to start in 1966. (Actually, a long-range plan has been in existence for some time, but has not been as operational in character as the 1-year projections.[16])

Labor Mobility and Industry Relocation

The north and south of the Netherlands are considered problem areas because of their relatively high rate of unemployment as compared with the country as a whole. The government pursues a twofold policy with respect to these areas: It encourages the establishment and expansion of industries in depressed areas, and it promotes migration of workers to other areas.

In localities earmarked as "development centers," grants may be made toward the cost of building new factories or expanding existing ones. There are 44 such centers. In some of them, grants have been given to improve the infrastructure, such as communications facilities, housing, schools, public health, recreation, and transportation.

The policy with regard to encouraging labor mobility was changed rather significantly in 1960. Up to that time, the government granted allowances to meet removal and other expenses of workers migrating from high unemployment to labor-shortage areas. However, it became apparent that this scheme might conflict with the policy of encouraging industry to locate in development centers. Consequently, in 1960 the policy was changed to promote migration of qualified labor *to* rather than *from* the development centers to help meet the needs of industry locating in these areas, and to discourage workers from moving to the congested Randstad-Holland area.

Removal allowances vary according to the marital status and physical health of the worker and the place where he is moving. All workers migrating to any area other than the Randstad-Holland, where most industries are located, are eligible for expenses to cover travel and moving costs for themselves and dependents. They may also receive 240 gulden ($66) plus 40 gulden ($11) for each child toward the cost of furnishing a home. Workers moving to development areas receive, in addition to the foregoing allowance, 50 percent of the cost of board and lodging or, if commuting, 50 percent of the travel costs up to a maximum period of 1 year. Disabled workers receive 80 percent of board and lodging and 100 percent of commuting costs. Development areas have also been given an extra quota of 2,000 dwellings per year and other priorities designed to encourage industrial development and worker migration. It is estimated that out of 175,400 new jobs created in Holland between 1950 and 1962, only 18 percent were in the highly industrialized western part of the country and 82 percent elsewhere, including the development areas.[17]

Seasonal Unemployment

The government creates employment during the off season for workers in construction and agriculture. Mechanization and rationalization are reducing seasonal peaks in agriculture. The government is providing training for agricultural workers in carpentry, masonry, metalworking, and other skills to enable them to do repair jobs on the farm which otherwise would have to be performed by outsiders. Another means being used to counter seasonal unemployment is to have factories, during their off season, loan their workers to other factories in need of help.[18]

Handicapped Workers

Each Employment Service office has a special "mediation" department that specializes in finding employment for handicapped persons. Employers can be compelled by law to employ at least 2 percent handicapped workers in their plants.[19]

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[15] *OECD Management Seminar, op. cit.*, p. 88.

[16] Letter from Prof. J. Windmuller, Nov. 15, 1965.

[17] *International Trade Union Seminar On Active Manpower Policy: Supplement to the Final Report*, Vienna, Sept. 17–20, 1963, Manpower and Social Affairs Directorate, OECD, Paris, 1964, ch. on the Netherlands, pp. 157–164; also *OECD Management Seminar, op. cit.*

[18] *OECD Management Seminar, op. cit.*, p. 90.

Retraining

In 1964 there were 24 government centers for the vocational training of adults in the Netherlands. The number of persons completing government-sponsored training programs has declined gradually from about 6,800 (0.17 percent of the labor force) in 1950 to 2,200 (0.05 percent) in 1963. Since 1945 about 60,000 persons have completed adult training courses. The reduction is directly related to the decline in unemployment, as adult training is limited to unemployed and disabled workers. Practically all the training courses are in the building and metal trades, and there are few training opportunities available to women. Though in principle persons between 18 and 50 are eligible for courses, the trainees are mostly younger workers. Selection standards are high, and efficiency, as measured by future productivity, tends to be the major objective. In these respects—age, selection, and objective—adult training in the Netherlands most closely resembles France.[20]

In February 1964, basic allowances for trainees over 23 years of age and with family responsibilities were raised to approximately 100 gulden ($27) per week, which comes to about 75 to 80 percent of average manufacturing earnings and is roughly equivalent to the level of unemployment compensation. The training allowance had previously been raised in 1962 when there was a problem of trainees dropping out before completing courses, particularly in the building trades, to take advantage of "black wages" in the construction industry. An interesting feature of the Netherlands program of adult training is the payment of small bonuses to trainees based on performance as measured by grades received in courses.

Because of the small size of the country and the strategic location of training centers, practically all trainees live at home and housing allowances are paid only in special cases. They do receive daily transportation costs to and from the center for distances in excess of 5 kilometers (3 miles). Trainees completing building trades courses receive a set of tools and 3 gulden ($0.90) per week for a fixed average training period.[21]

Dutch training is geared to individual needs, and a trainee is permitted to proceed from one training assignment to another according to his aptitude. Under this system trainees may take varying periods of time to complete the same course. The longest training programs average about 72 weeks, but some trainees take 2 years while others complete the same courses in well below average time. This approach has the advantage of permitting trainees to enter a course at any time without waiting and, according to Dutch training officials, results in more thorough training.

The Dutch have a rather unique system of subsidizing training of unemployed workers in industry. An employer who hires an unemployed person with the intention of training him is entitled, under a program approved by the Employment Service, to receive an allowance for the difference between the productivity of the trainee and that of a fully trained worker. The allowance varies as training progresses and productivity increases.[22]

In summary, retraining in the Netherlands, while confined to a relatively small percentage of the labor force and restricted to a limited number of courses, contains a number of interesting features which may be worth trying in other countries on an experimental basis.

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[19] *Ibid.*, p. 91.

[20] M. S. Gordon, "The Comparative Experience with Retraining Programs in the United States and Europe," in *Employment Problems of Automation and Advanced Technology: An International Perspective,* J. Stieber, ed. Macmillan and Co., London (pub. scheduled in 1966).

[21] V. Martin, *Accelerated Vocational Training for Adults,* OECD, Paris, 1965, p. 124.

[22] M. S. Gordon, *Retraining and Labor Market Adjustment in Western Europe,* Automation Research Monograph No. 4, U.S. Department of Labor, U.S. Government Printing Office, August 1965, p. 86.

Chapter 7. Conclusion

The objective of this study was to determine the attitudes towards automation and technological change in full employment economies, the manpower problems faced in such countries, and measures taken to deal with those problems. At the risk of oversimplification, we would say that the West European countries studied are interested in the positive effects of technological development, whereas up to now the United States has been concerned primarily with the negative aspects of automation and technological change. The major question posed in the full employment countries is: "How can we speed up technological development in order to increase productivity and the rate of economic growth?" In the United States the predominant question has been: "What is the effect of automation on unemployment and what can be done to minimize adverse effects on employees?"

This difference in attitudes reflects the different unemployment situation and manpower outlook in the United States and most of the countries in Western Europe. With a high rate of unemployment, a rapidly expanding labor force, and an economy undergoing rapid technological change, the United States must not only create a few million new jobs each year to reduce unemployment and absorb new entrants into the labor force and offset increasing productivity; it must also adjust the skills of its manpower to the requirements of a technologically advancing economy. The West European countries already have full—some of them overfull—employment and face a period of declining growth in their active populations during the next 5 years. Their problem is not one of job creation, but of job elimination. Their efforts are directed at the most efficient utilization of available labor supplies and drawing upon manpower reserves, wherever possible, to increase the size of their active populations.

Most of the countries studied are using both "push" and "pull" methods to achieve their economic objectives. Industry is being pushed by government to modernize, adopt advanced technology, locate in areas of labor surplus, and provide necessary training for their workers. Among the inducements offered to industry are subsidies, low-interest loans, tax allowances, compensation for costs of training manpower, and other financial incentives. At the same time workers are being pulled toward greater acceptance of the adjustments required by rapid technological advance through a variety of measures which differ from country to country, and include relatively high levels of unemployment insurance, severance pay, generous retraining allowances, moving allowances, limited earnings guarantees, provisions for early retirement with liberal pensions, and, most important of all, a full-employment economy which offers alternative job opportunities to those who need them.

There is a striking difference between Western Europe and the United States in the importance attached to full employment and even in the definition of the term. Full employment is endorsed as a top-priority policy goal not only by unions and government officials; it is accepted and supported by West European employers to a far greater extent than by their American counterparts. The necessity and propriety of government action to achieve or maintain rapid growth and full employment is accepted by unions and employers alike. Both are convinced that such action is in their best interest: Unions because they want jobs for their members, and employers because they recognize the economic advantages in terms of their own profitmaking potential.

Furthermore, full employment is defined much more stringently than in the United States: 2 to 2.5 percent unemployment represents the outer limits of acceptability rather than the 3 to 4 percent which is so widely accepted as consistent with a full employment economy in the United States. To start worrying about inflation and to take action to damp down the economy when unemployment was in excess of 4 percent and prices were rising at an annual rate of less than 2 percent would be inconceivable in the West European context.

Trade unions in the countries studied are less concerned over the impact of automation and changing technology than in the United States. Collective bargaining demands tend to stress such traditional issues as wages, hours, and vacations with pay, rather than job security. This reflects both an emphasis on priority issues and the feeling that government has the primary responsibility for protecting workers against unemployment and the adverse effects of technological change. Where job security issues have been injected into collective bargaining, they have centered on such subjects as extension of legal provisions for dismissal notice, advance consultation, severance pay, guarantees against loss of income in job transfers, early retirement for unemployed workers, retraining opportunities, and special provisions for older workers. On the whole, American unions have little to learn from their West European counterparts in the area of job security through collective bargaining.

The American system of industrial relations, by including detailed provisions regarding layoff and dismissal procedures in collective bargaining agreements, has avoided a problem that is found in several West European countries, where the order of dismissals is handled on an ad hoc basis. This often results in strikes and individual complaints when plant closures or economic conditions make layoffs necessary.

West European employers differ from their American counterparts in assuming a greater social obligation for providing continuous employment for their workers. This may extend to continuing to employ, or delaying dismissal of, workers who are no longer needed when alternative job opportunities are not readily available, and to helping find new jobs for employees about to be dismissed. There is also a greater acceptance by employers of government intervention in the labor market, as evidenced by the Redundancy Pay Act in Great Britain; the Industrial Training Act in Great Britain and the apprenticeship tax in France; regulation of collective dismissals in France, West Germany, and the Netherlands; individual dismissal notice requirements in all countries except Sweden; authority to compel employment of a specified percentage of handicapped workers in a few countries; and legal specifications of vacation benefits and limits on overtime work in some countries.

There appears to be a greater appreciation by West European employers of the perils that unemployment holds for the ordinary worker and a willingness to adopt a pragmatic solution even if it involves more government intervention than they consider desirable. This attitude is illustrated by the following comment by a British employer:

> We are out to make unemployment costless. We must have more flexibility in use of the work force. We want freedom to introduce technological change. To reduce resistance we must reduce fear. If we can make unemployment costless, people will not be afraid to become unemployed and therefore will not resist our efforts.

We have seen that all five of the countries studied have experienced significant changes in the structure of employment during the postwar years as a result of technological developments, the introduction of the Common Market, increased international competition, and other factors. The programs—old or new—employed to deal with manpower problems cannot generally be differentiated on the basis of the development that brought them into being, since the same program often serves more than one purpose.

In summarizing some of the programs in effect in West European countries, we proceed from the premise that while different labor market conditions may call for different approaches, these measures, with appropriate modifications to meet U.S. conditions, merit our consideration.

Dismissal Notice. Four of the five countries require employers to obtain prior approval or to give advance notification to the Employment Service before dismissing workers for economic reasons. In addition, individual employees are entitled to receive dismissal notice of varying periods, depending upon length of service. At the very least, this calls for advance planning on the part of employers and assures that they will make reasonable efforts to avoid or minimize dismissals. In some situations dismissals can be delayed, extended over a period of time, or even canceled by the government. In the United States, there are no legal restrictions on an employer's right to lay off or dismiss workers when they are not needed. Although many collective bargaining agreements provide for notice prior to layoff, the time period involved is generally no more than a few days.

Removal Allowances. All five countries provide removal allowances of various kinds, usually administered by the government employment service, to promote geographical mobility from areas of surplus manpower to labor shortage areas. However, even in countries with rather liberal allowances, most workers who move do so without financial assistance from government. In the United States, the public employment service is not authorized to reimburse expenses of workers moving from one area to another to seek or accept employment. However, the Labor Department has engaged in some "demonstration" projects under which it has given relocation assistance in a limited number of areas. In addition, a few collective bargaining agreements provide for paying the cost of relocation. But these are exceptions, and practically all American workers who move to accept jobs must do so on their own.

Retraining. Occupational mobility is encouraged in all countries by retraining programs which vary greatly as regards number and proportion of the labor force trained, types of courses offered, eligibility requirements, duration, and financial allowances to trainees. The United States has made rapid progress in training the unemployed under the Manpower Development and Training Act (MDTA). It is clear from European experiences that retraining is necessary in full employment economies as well as during periods of relatively high unemployment. The MDTA should be made permanent under legislation which will permit sufficient flexibility in its administration to adapt to the needs of the labor market. U.S. training allowances are much lower in relation to prevailing wage rates than allowances paid in the countries studied. As our unemployment situation improves, it will become more difficult to attract unemployed workers into courses and to keep them from dropping out before completion to accept jobs which may not be related to their training. This has been the experience of other countries even though their training allowances are more closely related to prevailing wage levels.

Some of the unusual features of retraining programs in other countries might also be tried in this country. For example, the West German program which refunds part of the wages paid by employers giving training to formerly unemployed workers; or the Dutch arrangement for subsidizing employers training unemployed workers for the difference in productivity of such trainees and fully trained workers. Many other features which might be worthy of experimentation are included in Dr. Gordon's excellent study of retraining in Western Europe.

The Employment Service. There is wide variation among countries in the role played by the public employment service. The best, as epitomized by the Federal Institute for Placement and Unemployment Insurance in West Germany and the National Labor Market Board in Sweden, are far superior to the U.S. Employment Service. On the other hand, our own system is probably on a par or better than those found in the other countries. The one respect in which the United States differs from all five countries is in permitting private profitmaking agencies to operate along with the public employment service. In none of the countries studied are agencies operated for profit permitted, except by special licensing or on a "temporary" basis.

Industrial Location. Great Britain and France control the location of new industrial facilities in order to keep new plants out of congested areas and to persuade them to locate in areas with relatively high unemployment. All countries try to influence location decisions by offering various inducements to locate in certain areas as opposed to others. There is a trend towards identifying and concentrating on "growth" or "development" centers rather than promoting industrial location in all areas of labor surplus. There is considerable difference of opinion regarding the long-term advantages and disadvantages of industrial location policies. The argument sometimes takes the form of debating the relative merits of moving workers and moving jobs. The latter appears to be getting more emphasis at this time. There is a need for more research to determine the costs and benefits of government programs to influence industrial location.

Unemployment Insurance. Systems for compensating unemployed workers differ from country to country and are difficult to compare. It would appear, however, that the U.S. unemployment insurance system, in terms of average benefits in relation to earnings and in duration of payments, is substantially inferior to the systems in West Germany and the Netherlands, about on a par with that in Sweden, and not much, if at all, better than those in Great Britain and France. Unemployed workers in the Common Market countries who meet specified requirements are also eligible to receive special allowances paid by the European Social Fund and the European Coal and Steel Community. The level of unemployment benefits takes on added importance because it is often used as a yardstick in setting training allowances in the United States and other countries.

Old-Age Pensions. In four of the five countries—Great Britain is the exception—eligibility for old-age pensions is not dependent upon whether or not one continues to work. In the United States there is a limit on permissible earnings of pensioners up to age 72. It would seem that the U.S. policy would discourage persons over 65 from continuing to work, while the West European countries' policy should have the opposite effect. However, the statistics on men and women over 65 in the labor force show that we have a higher participation rate for such persons than any of the countries studied. This may indicate that our old-age benefits are lower in relation to earnings before retirement and/or need than those in other countries.[1] Or it may merely reflect differences in custom or social values on the subject of older people working. Old-age pensions in all the countries, except Great Britain, are adjusted regularly for changes in the cost of living or in wages, which are used as a base for determining pensions. A few countries have provisions for early retirement with little or no reduction in pensions, or for special payments to workers over 60 who have been unemployed for a certain period of time.

We are not prepared to say which, if any, of the policies followed in other countries should be adopted by our own Government, with or without modification. These are fit subjects for consideration by the Commission, the Executive Branch, and the Congress.

In one area—research on manpower problems—the United States is acknowledged to be far ahead of Western Europe. In every country, professionals working in the manpower field praised both the quality and quantity of research by U.S. Government agencies and universities as compared with the relatively meager resources devoted to manpower research in their own countries. They were particularly impressed with the tendency to include budget items for evaluation purposes in legislation authorizing new programs. Efforts are being made in a few countries to persuade government departments concerned with manpower to follow the U.S. example with respect to evaluation research as well as manpower research in general.

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[1] M. S. Gordon, "Income Security Programs and the Propensity To Retire," Reprint No. 210, Institute of Industrial Relations, University of California, Berkeley, 1963.

In conclusion we should like to raise briefly two questions which, we think, merit further consideration.

It would appear that the high premium placed upon continued employment and avoiding or delaying layoffs and dismissals in some of the countries studied must result in some overmanning, inefficiencies in the production process, and higher unit labor costs. Whatever the social value of such policies, it is doubtful whether they are desirable or appropriate from an economic point of view. However, if we opt for having economic decisions in the firm made solely on economic grounds, as we have in the United States, we should recognize that the workers laid off with little or no advance notice are contributing indirectly to the increased efficiency of our firms. This recognition would indicate a policy of relatively liberal unemployment insurance benefits, generous retraining allowances, and other measures to ease the plight of the unemployed and help them to find employment as soon as possible.

But what do we find? Not only do we follow policies which take no account of the special hardships on employees who are laid off or dismissed with little or no advance notice, but we are also less liberal in the treatment of our unemployed and adult trainees than other countries. It hardly seems justifiable to make the unemployed pay twice for the increased efficiency which benefits everybody but themselves.

The other question relates to the great emphasis which is presently being placed on the high school dropout problem in the United States. In none of the countries visited did we find a similar concern over youths who had not had the equivalent of a high school education, despite the fact that a much higher proportion of 15 to 19 year olds are in the labor force everywhere than in the United States. In 1958, 66 percent of our youths aged 15 to 19 were in school as compared with about 30 percent in France, Sweden, and the Netherlands, and only 18 percent in Great Britain and West Germany.[2] The youths who are high school dropouts in the United States would, at the age of 14, 15, or 16, have completed normal schooling in almost every other country. They would be serving as apprentices, receiving on-the-job training in industry, or working at entry jobs in factories, retail establishments, or in some service capacity. None of the countries studied considered that these youngsters were unsuitable material for industrial training or employment. On the contrary, employers with whom we spoke said they could find immediate use for U.S. high school dropouts, provided they had no serious mental or physical disabilities. They pointed to the thousands of imported foreign workers who had a much lower average educational attainment, with no apparent effect upon their employability.

Yet, in the United States, dropouts who leave school at about age 16, are often considered unfit for training in industry or even for unskilled jobs. Are these youths so inferior or so poorly prepared for employment as compared with West European youths of the same age and with about the same or, in some cases, even less education? Is our technology so far in advance of that in Western Europe that a high school education is a prerequisite for even entry occupations? Or is the U.S. level of unemployment so high that employers can afford to set qualifications for new workers which are much higher than necessary for available job openings?

Answers to these questions should help us develop policies and programs better suited to solve not only the high school dropout problem, but also to deal with the broader problem of vocational education in the United States.

We believe that the dilemma of the unemployed high school dropout is as much a social as an economic and educational problem. It stems, in part, from a lack of correspondence between the normal terminal point in our precollege educational system and the age at which youths are legally permitted to leave school and seek full-time employment. The social norm in the United States calls for all boys and girls, regardless of interest or ability, to attend school at least until they finish high school, which is usually at age 18. But in most States they may quit school and seek work at age 16. Those who take this route are regarded as having deviated from the norm, and are branded as inferior products—high school dropouts—regardless of their reason for leaving school. This is a social stigma which many of them never shake off.

In other countries the dropout problem is virtually unknown because the terminal point in a youth's normal schooling coincides with the age when he either enters the world of work or goes on to special vocational training. He does not have to drop out of anything in midstream, because at 14, 15, or 16 (depending on the country) he has reached a normal stopping point in his education.

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[2] *Some Factors in Economic Growth in Europe During the 1950's*, Economic Commission for Europe, United Nations, Geneva, 1964, chap. V.

Prospective employers accept him for what he is, without wondering why he did not finish the years of schooling that every normal boy and girl is expected to complete.

If there is anything in this line of reasoning, we in the United States should try to achieve a coincidence between the normal terminal point in our precollege educational system and the minimum age when youths may accept full-time employment. This can be done either (1) by raising the school-leaving age and, at the same time, changing the curriculum to make school a worthwhile experience for the youths who constitute our present dropout problem; or (2) by reorganizing our educational system to introduce a normal stopping point at age 16 for those who choose not to continue their education. This should not deter the large majority from continuing their schooling to age 18 or beyond. It will, however, erase the social stigma from those who decide to terminate their education earlier.

Either alternative calls for drastic rethinking of our present approach to precollege education. But this is long overdue.

TECHNOLOGY AND THE NEGRO

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CONTENTS

Page

1. Automation and technology and the impact on the Negro worker ... III-131
    - The extent of the problem ... 131
    - The plight of the Negro worker nationally ... 131
    - The plight of the Negro worker—selected cities ... 132
2. The condition of Negroes in the American society ... 135
    - Problems of health ... 135
    - The housing problems and needs of Negroes ... 136
    - Problems in education and jobs ... 137
3. Some recommendations ... 142

3

Technology and the Negro

1. Automation and Technology and the Impact of the Negro Worker

The Extent of the Problem

No one can deny that automation will increasingly affect the Nation's unemployment and economic structure in the years ahead. President Meany of the AFL–CIO recently reported to a congressional subcommittee on the pace at which technology is automating jobs out of existence: From 1953 to 1960, 200,000 mining jobs were lost, 400,000 railroad jobs, and 1,500,000 jobs in factory production and maintenance. This job disappearance was taking place at the same time that the labor force was increasing by 6,500,000 workers.

The story is not all negative. Technological changes and automation, in fact, have provided many Negroes job opportunities in manufacturing, machine production, and services. This is evidenced by the large numbers of those, many with limited educational backgrounds, who found jobs in urban areas after migrating from farms and rural areas. Increased productivity and job expansion have helped the Negro worker. But unfortunately, in many instances gains have been offset by major problems in education, job opportunity, and related areas. These problems, coupled with the high incidence of Negroes being replaced as technological changes make jobs less physically taxing, make for continuing concern regarding the plight of Negro workers.

The most recent study of the impact of automation and technological changes on Negro employment was done by the writer in 1962. Included in this report are data on 40-odd cities where local Urban Leagues were familiar with the problems. A recent recheck with executives in selected cities indicates little change. I, therefore, shall rely heavily on these data.

At this time we do not have adequate statistical data concerning the impact of automation on the employment structure generally, nor on the Negro labor force in particular. However, we do know that automation and related technological change tend to create the greatest displacements in those occupational classifications where the bulk of the Negro labor force is concentrated. Furthermore, when we place automation in its proper context within the total employment structure and examine the status of the Negro worker within that structure, the information is ample to make a crystal clear picture—and dismal it is. Job opportunities for the Negro worker have traditionally been, and are now, severely restricted. Predictions for the immediate and long-range future indicate that the plight of the Negro worker is very likely to get worse instead of better unless drastic countermeasures are instituted now to offset current trends. This is no wild-eyed alarm stemming from irresponsible visionaries. It is a plain, honest, though unpleasant fact, supported by nationwide figures from the U.S. Employment Service and by regional estimates from local Urban League affiliates.

The Plight of the Negro Worker Nationally

The Employment Security Review for April 1962, states: "Nonwhite workers are primarily employed in occupations with high unemployment rates, such as operatives, laborers, and service workers; however, nonwhite unemployed rates exceed those of white workers in nearly every occupation group."[1] An examination of appended tabular data reveals that the unemployment rate of nonwhite workers not only exceeds that of white workers but exceeds it by almost 100 percent in *every* occupation group except operatives and laborers, where the gap is smaller due to the heavy concentration of Negroes in these categories. Moreover, projections of employment growth by occupation over the current decade show an expected continuation of what has been a long-term decline in the number of unskilled jobs relative to professional and technical occupations.

Overall, the jobless rate as of December 1961 was 5.2 percent for white males, but 12.4 percent for nonwhite males, and 4.7 percent for white females. Further, "Nonwhite workers made up less than 12 percent of the labor force, but accounted for 22 percent of the total unemployed."[2]

In assessing the magnitude of the problem of underemployment among Negroes, our local affiliates report "no figures available," "data not broken down by race," and so on. It is not difficult, however, to project the enormous underutilization of potential as well as actual skills of the Negro labor force when we note the disparity between the Negro's distribution over the occupational scale and his relative proportion to the population. As of 1959, with no evidence of appreciable change since then, Negroes constituted less than 10 percent of the four top major occupational groups: Skilled workers, clerical and sales workers, proprietors and managers, and professional and technical people. At the same, they constituted from approximately 13 to 33 percent of the four lowest occupational groups: Semiskilled workers, service workers, unskilled workers, and farmers and farmworkers.[3]

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[1] *The Employment Security Review*, April 1962, p. 46.
[2] *Ibid.*, p. 17.

Those who would attempt to attribute this distorted distribution of the Negro work force primarily to the Negro's undeniable deficiency in basic education should note two important factors: (1) Substantial, though admittedly insufficient, increase in educational status of the Negro over the past two decades; and (2) the Negro's lack of access to education and training due to racial discrimination and exclusion. According to the *Employment Security Review:* "While the median school year completed for the nonwhite population 25 years of age and over has risen from 5.8 in 1940 to 8.1 in 1959, the median for the total population was 11.0 in 1959. Similarly, the nonwhite adolescent is all too often denied equal opportunities for vocational education. He is offered training for only those jobs in which nonwhites have traditionally been employed, rather than for those more highly skilled jobs where opportunities are rapidly increasing . . . moreover, nonwhites are almost completely excluded from apprenticeship programs."[4]

Relevant to the problems of the Negro worker and reflective of his second-class status in the economy are the figures on family income. "Nonwhite families had a median money income of $3,233 in 1960. Although this represents a remarkable advance over the figure of $2,099 for 1947 (in 1960 prices), the magnitude of the problem still remaining is indicated by the fact that in 1960 the median income for white families was $5,835. In 1960, 11 percent of white, but 32 percent of nonwhite, families had money income of less than $2,000, while 37 percent of white, but only 14 percent of nonwhite, families had money income of $7,000 and over."[5] Commenting on the role of discrimination as a basic causal factor in the plight of the Negro worker, the same publication states: "Many nonwhite families are trapped in a vicious circle: Job discrimination and lack of education limit their employment opportunities and result in low and unstable incomes; low incomes combined with direct discrimination reduce attainable levels of health and skill and thus limit occupational choice and income in the future; and limited job opportunities result in limited availability of vocational education and apprenticeship training."[6]

Thus, from every perspective, the same picture emerges nationally. It is clear that the unemployment status of the Negro has not only failed to keep pace but has actually lagged behind in proportion to the population, work force, and gain in educational attainment.

The Plight of the Negro Worker—Selected Cities

Reports from selected cities across the Nation define the problem by census regions and local community areas. In addition to illustrating the extent of the problem, these reports note limited remedial measures currently being undertaken by government, business, industry, labor, and local communities, and evaluate their relevance and effectiveness. No apologies are made for the fact that statistics are often based on limited, or are not derived from primary sources, and are often presented as estimates; every available source of information was tapped even though much remains to be desired in technical sophistication in some instances. These estimates are educated guesses of professional staff closely in touch with conditions in their respective communities and will, we are certain, be found to compare favorably with more "scientific" data when and as these data become available. The thoroughness and dedication with which the reports were prepared are evident in the extracts.

In Rhode Island, a depressed and labor surplus area, the Negro unemployment rate has been twice that of the general population in every census since 1930. The enormity of the retraining problem is indicated by the fact that 67 percent of unemployed Negroes in 1960 were in semiskilled and unskilled occupations.

There has been a heavy increase in Negro population in Atlanta, Ga.—from 165,816 in 1950 to 231,790 in 1960—largely due to displacement of farmworkers by automation and other technological advances.

The extent of the problem in Baltimore, Md., is not known statistically. However, 90 percent of dropouts in Baltimore public schools are Negroes. The major instrument for improving job opportunities for local youth is the Joint Apprenticeship Council, from which Negroes are excluded and around which there appears to be an aura of secrecy.

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[3] *Ibid.*, p. 17.
[4] *Ibid.*, p. 16.
[5] *Ibid.*, p. 16.
[6] *Ibid.*, p. 16.

Tampa, Fla., is a critical unemployment area with expectations of a worsening situation. Statistics are not available by race, but the size of the problem is indicated by (1) a decline in the tobacco industry due to automation and Government embargo, (2) the appreciable decrease in number of work permits in the period 1959–61, (3) a heavy decrease in employment on docks, a major job source for Negroes, due to the use of automated material handling equipment, and (4) exclusion of Negroes from apprenticeship programs.

Automation has displaced thousands of Negro workers from farms and crafts in Louisiana, Mississippi, and Alabama, creating an unemployment problem of major proportions. In 1961, 70 percent of the 40,000 unemployed in metropolitan New Orleans were Negroes, and an estimated 50 percent of Negroes were underemployed.

Unprecedented opportunities were made available for Negro youth qualified in such fields as engineering, mathematics, accounting, drafting, stenography, and typing at the NASA-Michoud operation which, in 1965, employed 8,000 to 10,000 people. An additional 8,000 to 10,000 will be employed in new related operations.

Racial barriers are being lowered in area Federal service, in such companies as Western Electric and IBM, and generally in industries under Federal Government contracts.

A major disruption created by automation in Stark County, Ohio, has resulted from reduction in plant size and plant relocation. A good example is provided by Republic Steel Corp. and Timken Roller Bearing Co., two firms which together account for approximately one-third of the total manufacturing employment in the area. Republic recently consolidated four divisions and removed top administrative personnel to Youngstown, Ohio. Timken has established plants in France and Australia.

Paradoxically, along with these reductions and relocations, the number of new firms in Stark County increased by 18 from 1954 to 1962. Yet, with this increase, the number of persons employed decreased by 4,215 in the period 1954–57.

The World War II period (1942–46) saw Detroit, Mich., industry recruit extensively in the rural South, bringing to the area thousands of individuals with low academic attainment. Around 1952, Detroit's total employment configuration began to change. Intensification of labor-management conflicts, sharpening of political differences, increasingly crowded schools, poor housing, reduced per capita income, and reduced recreational outlets combined to form attitudes which continue to cripple intelligent attempts to eliminate the negative effects of automation on the work force. The Negro worker, a needed asset in 1942, was caught in the middle of a sociopolitical maelstrom in 1962, and presents an economic and racial problem of the first magnitude.

It is difficult to measure the extent of the problem statistically. However, of the approximately 101,000 people unemployed in the Detroit area in March 1962, approximately 59 percent were Negroes.

Underemployment of Negroes in Detroit has been traditional, with conservative estimates placing the proportion of the Negro work force underemployed at 35 percent.

Many individuals seeking a solution to Detroit's hard core unemployment problem emphasize the need for retraining workers displaced by automation or other causes. But job retraining is not simple.

> (1) Seventy percent of those presently unemployed are not academically prepared to master short-term retraining programs.
>
> (2) The assumption is false that the untrained want to be trained, and further that they want to be trained for jobs with skills that could be attained in a short period of time.
>
> (3) The factor of racial discrimination, still present in the manipulations of Detroit's labor force, precludes any "open sesame" policy as regards the placement of a retrained worker in the newer jobs being created.

In the period 1956–60, Trumbull County, Ohio, lost 15 plants which had employed an average of 4,000 workers annually. A 1960 study of the higher skill potential of unemployed persons receiving extended unemployment insurance claims payments showed many to be retrainable, and a skills survey in Trumbull and Mahoning Counties showed expected labor shortages in 22 of 33 key skills.

The Cudahy case in Omaha, Nebr., dramatically exemplifies not only the effects of automation and technological change on the employment structure of a community, but also the salubrious effects that concerted, well-planned, and carefully executed community effort may have on resolving inherent problems. Of 1,000 persons involved in the Cudahy automation layoff in 1962, approximately 675 were dislocated totally from their type of work. The joint efforts of the Nebraska State Employment Service, Cudahy Packing Co., Omaha School system, Mayor's Committee on Automation, and Local 60 UPWA, AFL–CIO, resulted in the selection of 150 persons for retraining who were receiving unemployment insurance. An additional 90 qualified for Cudahy-financed training. Ninety-five more were retrained, and 160 have been placed in jobs. Thus 495 out of the original 675 displaced have been retrained or reemployed.

In Phoenix, Ariz., the large pool of workers displaced by mechanization need retraining. For example, in 1958, 46 percent of the cotton harvested was machine-picked. By 1959, the percentage had increased to 60 percent. In 1960, a total of 1,921 machines picked 70 percent of the cotton, while in 1961, the number of machines had risen to 2,019, harvesting 83 percent of the cotton produced. More startling is the revelation that during the 10-week period from October 20 to December 15, 1961, 2,019 machines picked 484,000 bales, while a mere 64,000 bales were hand-picked by 9,000 workers. The peak harvester force in 1960 numbered 21,000 as compared with 13,600 in 1961.[7]

Unemployment problems in the San Diego area are generated less by automation than by layoffs in the aircraft industry and termination or expiration of Government programs in the missile field. Of the approximately 24,900 unemployed, an estimated 20 percent are Negroes. The State market analyst estimates that the total unemployed group are retrainable.

Negroes comprise 8.6 percent of the total population of 2,783,359 in the six-county San Francisco, Calif., area. Of these, 29 percent are skilled workers, 21.2 percent are semiskilled and unskilled workers, 17.3 percent are city, county, or State government workers, and 6.4 percent are professional workers. Restrictions based on race as we have known them traditionally do not exist, and the highly trained Negro has relatively little difficulty in securing a good job. However, relatively few Negroes are prepared to enter the new high labor demand occupations, such as chemists, electromicrowave and electronic designers, digital programers, technical writers, technical salesmen, secretaries, and insurance and related workers.

Generally speaking, the problem of displacement by automation has been relatively slow in coming to the Northwest, especially Seattle, Wash. It is true that over the past half dozen years, men and women have lost jobs in areas where automatic equipment has been brought in. In some of the larger banks, checkproof readers have been displaced by machines that do the job much more quickly. Here and there an industry will also put in a machine or some equipment which will displace a half dozen or so persons. These, of course, are usually absorbed in the work force in other capacities.

To recapitulate:

(1) The present intolerable plight of the Negro worker in America is becoming worse and will become permanent unless constructive measures are immediately undertaken.

(2) Critical areas exist in every census region.

(3) Current and projected unemployment trends hold out little hope of better times for Negro workers who look for improvement of their lot.

(4) Repeatedly it was said that "little is being done." This is reported as fact, not in a desire to defame character or disparage the positive accomplishments thus far of government, industry, labor, and education. We cannot state too strongly, however, our conviction that all good work to date, however lofty in motive, however progressive in intention, however effective in accomplishment, is not yet enough.

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[7] Source: Farm Labor Office—Arizona State Employment Service.

2. The Condition of Negroes in the American Society

Problems of Health

The Health of Negroes Measured in Minuses. When we speak of the health of Negroes in this country, we are speaking of a minus quantity. The same is true of the health care available to Negroes: There is less of it and it is less good.

Economic deprivation has led to less resistance to disabling illness; social deprivation has led to less medical care, less adequate medical care, and less assistance in meeting its cost. The consequences of insufficient and inferior medical care have been harsh: Lingering illnesses, dragged-out disabilities, premature death.

Negro expectant mothers simply do not get the basic prenatal care that most white expectant mothers take for granted today. Fewer Negro mothers have their babies in hospitals than do white mothers. The results are predictable: More deaths of Negro mothers in childbirth—four times as many as white mothers.

Women without prenatal care are about three times more likely to give birth to premature babies than women who receive proper care. Very small premature infants are 10 times more likely to be mentally retarded than full-term children.

No particular disease accounts for the greater number of deaths among middle-age Negroes. The major causes of death are the same as for whites—heart disease, cancer, brain hemorrhage. But proportionately more Negroes die from each of these than do whites in the same age bracket.

Thus, fewer Negroes than whites live to reach old age because Negroes constitute only 6 percent of all Americans 65 and over. In spite of miracle drugs and antibiotics, deaths from tuberculosis of Negroes 65 or older are 54.9 percent per 100,000 as compared with 21.3 percent per 100,000 whites.[8]

The facts are: The Negro, in comparison to white persons, has more diseases and disabilities; is unable to function at full physical capacity for one-third more days; is sick enough to require bed rest on twice as many days; and loses one and one-half times more days from work because of disease and disability.

Health Care

Separate and unequal. The medical care needs of Negroes are disproportionately large, yet the health services they receive are disproportionately small.

Inequalities are to be found in practically every kind of health service, ranging from care of chronically ill older persons to care of those suffering from mental distress. This pattern of inequality is found in all sections of the country. Not surprisingly, the greatest disparity is in the South—a region whose spokesmen, ironically, assert that they "take good care" of Negro citizens.

Title VI of the 1964 Civil Rights Law provides hope, and a change is beginning to show in the health field. We cannot rest content, however, for until all racial barriers are removed, Negroes cannot hope to get a fair and reasonable share of good medical care.

Insufficient and inferior. An important obstacle to good medical care is ignorance. Many Negro citizens simply do not know about potential benefits of medicine, the proper time to go to doctors, dentists, public health nurses, or the location and mechanisms of using hospitals, clinics, and other medical facilities.

Racial discrimination in the Nation's educational system contributes tragically to the incidence of preventable disease and premature death among Negro citizens. For without quality education people cannot understand what modern medicine can offer them, or learn the methods of availing themselves of its benefits.

Opportunities To Work in Health Fields

Shortage of Negro Health Workers. Although Negroes make up more than 10 percent of the population, fewer than 2 percent of doctors and dentists are Negro and fewer than 5 percent of all registered nurses are Negro. As with white health workers, the output of new personnel is not keeping up with the growth of the population, but the gap for Negroes is growing faster.

There are about 5,000 Negro doctors, or about one out of every 3,700 Negroes—compared to one out of every 640 white persons. There are only 27 Negro physicians for every 100,000 Negroes contrasted with 157 white doctors for every 100,000 whites. For Negroes to catch up, they must graduate 23,000 more doctors.

The tragically small number of Negroes qualified to undertake training programs is one of the most pernicious consequences of racial discrimination in this country. The potential of the Negro population has been severely stunted by the grossly inadequate education that has been generally available. No significant increase in the supply of Negro health workers is possible until segregated and ghetto schools are abolished, and until the quality of public education at all levels is dramatically improved.

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[8] Data from New York City Chapter, National Tuberculosis and Health Association, 1965 publication.

The Housing Problems and Needs of Negroes

In the beginning of the 20th century, over 90 percent of the Negro population lived in the South, and most lived on farms. During the last 60 years, the search for a better life has led the Negro to leave the farm and the South, with the majority going to urban centers in the West, Midwest, and East, leaving less than 60 percent of the Negro population in the South in 1960. (See table 1.) In 1960, the urban nonwhite population was 14.8 million, an increase of 4.8 million over 1950.

TABLE 1. 1900 AND 1960 DISTRIBUTION OF NONWHITES—IN PERCENT

Area	1900	1960
Total	100	100
Northeast	5	15
North Central	6	18
South	87	56
West	2	11

SOURCE: *Our Nonwhite Population and Its Housing*, July 1963, HHFA, p. 2.

Central City Concentration. In 1960, 10.3 million, or more than half the nonwhite population, lived in the central cities, approximately 63 percent more than in 1950. On the other hand, over the years the white population has been decreasing in the central city, and in 1960 less than one-third of the white population lived in the city.

The picture is more sharply drawn when the Nation's 212 standard metropolitan statistical areas (SMSA's) are examined. Table 2 shows that 78 percent of the nonwhite population live in the core city and only 22 percent in the suburbs, while about 52 percent of the white population live in the suburbs as against about 47 percent in the core city. In only the South do we find more whites in the core city than in the suburbs.

TABLE 2. 1960 POPULATION IN CENTRAL CITY AND SMSA'S—IN PERCENT

Region	White		Nonwhite	
	Central city	Balance SMSA	Central city	Balance SMSA
United States	47	52	78	22
Northeast	46	54	81	19
North Central	49	51	88	12
South	53	47	75	25
West	43	57	69	31

NOTE: Totals may not equal 100 because of rounding.

Source. *Our Nonwhite Population and Its Housing*, July 1963, HHFA, p. 4.

The 10 Largest Cities. The nonwhite population increase in the 10 largest cities (see table 3) was 56 percent in 1960, while the white population decreased 8 percent from 1950. In fact, almost one-fourth, or some 4.9 million nonwhites, were jammed in the cores of these 10 largest cities in 1960.

TABLE 3. NONWHITE POPULATION—10 LARGEST CITIES—1960

Rank		City	Nonwhite population (000)	Total population	Changes (000) 1950-60			
City size	Nonwhite population				White	Percent	Nonwhite	Percent
1	1	New York	1,141	14.7	−476	−6.7	366	47.2
2	2	Chicago	838	23.6	−399	−12.8	328	64.4
3	6	Los Angeles	417	16.8	303	17.3	206	97.2
4	3	Philadelphia	535	26.7	−225	−13.3	156	41.2
5	4	Detroit	487	29.2	−363	−23.5	183	60.4
6	7	Baltimore	328	35.0	−113	−15.6	102	45.3
7	9	Houston	218	23.0	250	53.1	92	73.2
8	8	Cleveland	253	28.9	−142	−18.6	104	69.3
9	5	Washington	419	54.8	−173	−33.3	134	47.3
10	10	St. Louis	216	28.8	−168	−24.0	62	39.9

Source: *Our Nonwhite Population and Its Housing*, July 1963, HHFA, p. 4

Housing Conditions. Home ownership, the great American dream, is still just a dream for 6 out of every 10 Negroes. Despite the fact that the physical quality of housing occupied by nonwhites improved between 1950 and 1960, 44 percent of Negroes (4 of every 10) still live in substandard housing.

Although in terms of percentages the degree of overcrowding (1.01 or more persons per room) decreased among nonwhites between 1950 and 1960 from 32 to 27 percent, the number of overcrowded units increased from nearly 1 million to 1.3 million, while overcrowded white units dropped 0.2 million. The picture is blacker when we look at seriously overcrowded units (1.51 or more persons per room). Such units occupied by nonwhites increased by 44,000. On the other hand, 41,000 fewer white units were seriously overcrowded.

Needs. Reports from across the Nation indicate that housing has become more segregated in the past 10 years. The Negro trying to buy or rent better housing too often is met with bombs, riots, or inflated prices. Segregation and discrimination confine the Negro's search to a limited area which becomes more and more crowded; the housing becomes progressively worse; and the ghetto becomes a slum.

There are slightly more than 5 million Negro families, of which half have annual incomes of less than $3,900. Based on income and the condition of the dwelling units they occupy, an estimated 1 million Negro families are in need of low-rent public housing.

Next to public housing, probably the most pressing need is adequate housing for the so-called "middle-income group" that earns between $4,000 and $6,000 a year. All too frequently these families are forced to resort to substandard or badly deteriorating housing, since they earn too much to be eligible for low-rent public housing and too little to afford new or recently constructed housing.

Such families present quite a problem for local urban renewal officials because the existing supply is inadequate to their needs, and because of the great difficulty in constructing or finding new units at low enough room costs. Thus, families in this bracket are extremely difficult to relocate in the existing market, and new avenues must be opened.

In spite of census reports that the housing problems of nonwhites improved somewhat between 1950 and 1960, the nonwhite home seeker finds it almost impossible to provide an adequate dwelling for his family. Some 188,000 nonwhite families in 21 metropolitan areas throughout the country have incomes in excess of $6,000 a year. One study (Housing and Home Finance Agency) reported that nonwhites with incomes between $7,000 and $10,000 made a potential market of approximately 45,000 units. However, no appropriate actions have been taken to develop satisfactory housing for this group.

Despite the improvement in recent years, 5 of every 10 Negroes are still living in substandard housing.

Approximately 20 percent, or 628,494 nonwhite families, were living in dilapidated rented dwellings, some over 30 years old and overcrowded. For this group, either new housing is needed or a major effort must be made to rehabilitate existing housing.

Every urban area needs to eliminate obsolete housing and upgrade neighborhoods to meet the demographic and economic challenges posed by continued migration to the city. The Federal Government, through the Urban Renewal Administration, provides more than two-thirds of the cost of the needed improvements. Despite the preponderance of Federal assistance, the Urban Renewal Administration has encouraged local initiative by insisting that urban renewal is a local program. However, it thereby creates the setting and climate for narrow and biased local interests to pervert the intent of the Federal legislation . . . "a decent home and a suitable living environment for every American family." Consequently, in many communities, the minority population find they do not have a voice in the renewal decisions. Negroes thus find that the selection and treatment of renewal areas either ignore their needs (downtown renewal), or exploit their holdings (Negro removal), or worsen their situation by increasing the degree of segregation.

In many communities Negroes find relocation practices ineffective because the planning was based on glib generalities and on unwillingness on the part of municipal authorities to solve effectively the problems presented by very low-income or minority families.

Problems in Education and Jobs

Discrimination. Discrimination is the most serious and fundamental problem confronting Negroes. This awesome monster crops up in training and education, and plays an important role in turning a poorly prepared product out into the work-a-day world. Most important, poor work backgrounds that result from discrimination make it impossible for Negroes to qualify for many jobs now available or that will appear during the coming years.

Even when there may be no discrimination in a particular job-related situation for a particular Negro, his difficulties in securing advancement or placement stem directly from past discrimination in education and training opportunities. The specifics may vary, but the fundamental disease is somewhere in his economic history. Discrimination is at the core of each problem discussed below.

Training. The net result of discrimination in training opportunities is the present glut of the market with millions of unskilled, unqualified Negro workers and jobseekers.

Lack of vocational and technical skills. Negroes have historically been denied equal opportunities for vocational and technical training. The feeling that Negroes should not be trained for jobs unless there were job possibilities has contributed to Negroes being unemployable because they were not given the chance to learn necessary skills. In the South, little or no vocational training was provided in areas other than gardening, cooking, sewing, or other traditional areas of employment. Technical educational opportunities were almost nonexistent until World War II, except in large cities or in the segregated land-grant colleges and other post high school institutions attended by Negroes.

New Negro workers find it difficult to find suitable employment, and the opportunities of older Negro workers are limited because no provisions have been made for them to learn new skills on the job or in organized educational programs. Only in recent years have positive steps been taken to give Negro workers an opportunity to apply for on-the-job training. Despite this opportunity, many find they very often lack the skills and educational requirements to make satisfactory progress in such training programs.

Lack of apprenticeship opportunities. Of all training barriers, those in apprenticeship programs have been most unyielding to the Negro's efforts to upgrade his skills. Only recently has noticeable progress been made. The lack of apprenticeship opportunities constitutes one of the greatest tragedies facing Negro youth who wish employment. While participation in apprenticeship programs is considered the best way to involve large numbers of young people involved in craft skills, such opportunities will be difficult to attain: Apprenticeships are rigidly controlled by management, labor, and government, and it is absolutely necessary to understand that Negroes will be afforded greater opportunity only if these three groups step up their efforts. Another tragic fact must be faced: It is extremely difficult to develop opportunities for apprentices when many skilled craftsmen are on layoff or when there is substantial unemployment.

Inadequate educational and vocational counseling. Many of those counseling Negro youth are either not qualified or do not care about doing a genuine job. They know little or nothing about these youths, their ambitions, their aspirations, or their problems. Many of these counselors have advised Negro youth to accept early work permits or stop their educational programs any time a job became available, and honestly thought they were helping them.

While this situation has prevailed in so-called integrated educational settings, Negro youth in segregated schools with a full complement of Negro teaching personnel have had problems no less frustrating. Here any semblance of guidance and counseling services has been almost completely nonexistent, and the little there is has become the responsibility of teachers whose orientation to the world of work consisted only of what they had read, seen, or heard. Their own lack of experience with business, industry, government, and labor made it impossible for them to do anything resembling a realistic counseling job.

Recruiting

Unrealistic recruiting programs. As the number of Negro youth in colleges continues to rise and the quality of their education continues to improve, recruiting on college campuses should become a more fruitful medium for expanding job opportunities. Unfortunately, however, many Negro youths still are not able to move into the broader job market because recruiting and placement services available to them before they leave college are inadequate.

In predominantly Negro colleges, there is a grave shortage of placement services; in predominantly white colleges placement officials continue to be reluctant to believe that recruiters have a genuine interest in interviewing all qualified candidates, regardless of race. The use of interracial teams for visits to all campuses would show Negro and white youth alike that the present world of work can and does make use of the skills of all qualified workers. This would say to Negro youth, "Here is living proof that there are opportunities for you with my company."

Negro college youth do not readily accept mere statements that changes are taking place. They see too few examples of progress and too little evidence that opportunities are opening to them. Their skepticism is the direct outgrowth of the recruiting practices of businesses and firms which continue to overlook the Negro student or graduate as a prospective job applicant.

Lack of cooperation between Negro colleges and employers. Closely related to the problems of recruitment and placement is the lack of mutual information on the part of Negro colleges and industry. This ignorance can be removed only if industry and business offer teachers opportunities to obtain firsthand knowledge of business operations. Such knowledge can then be used to revamp curriculums to meet industry's needs. The colleges on their part should call on persons from business and industry for help in activities other than commencement and fundraising.

Misinformation about Negro jobseekers. The extent to which misinformation and distorted notions about Negroes and their work habits affect job opportunities can be measured in such phrases as "jobs for Negroes," "white jobs," "Negroes work best at jobs that require muscle and endurance," "Negroes like to work with other Negroes," "white people will not work with Negroes," "Negro men may not work with or around white women," and "Negroes cannot supervise white workers." In many instances, it has been almost impossible to change the attitudes of some employers because of such ingrained notions.

Inability of Negro youth to pass written examinations. Negro job applicants fail in alarming numbers to pass written and oral screening examinations. Admittedly, many Negroes have not had a great deal of experience with tests and examinations. However, the major problem appears to be only indirectly related to skills or abilities, and more a matter of attitudes toward tests and the belief that one will not be employed no matter how well one does on such tests. There is also evidence to support the contention that even if a Negro passes the written portion of the test, he is likely to be eliminated in the oral or personal interview.

And then, passing the test only means that his name is placed on an eligibility list—then a candidate must wait to be selected over others also on the list. Until discrimination in the testing and selecting process is removed, Negroes will continue to have negative attitudes toward tests and as a result, will perform unsatisfactorily.

Advancement on the Job

Integrating the work force. The problem of integrating the work force requires the attention of top management and firm plans for implementation of policy at all levels below. Too often policy statements made at the top are considerably watered down by the time they reach the working level, causing many Negroes to lack faith in business, industry, government, and labor. Yet experience has shown that excellent working relationships do not change when well-planned steps are taken to assure Negroes opportunities for promotion and transfer to more responsible jobs.

Lack of opportunities for on-the-job training and retraining. Efforts must be made to give underemployed Negroes an opportunity to seek jobs at higher levels, with additional training available in or out of the plant. This is especially needed when a firm opens new plants in the same area and needs additional workers, or when layoffs are probable for employees not trained to more advanced operational techniques.

Special on-the-job training programs, sponsored with Federal funds, are just now beginning to have an impact on training and employment opportunities. Before they are laid off, workers at lower level jobs should be offered training opportunities to increase their skills and maintain seniority rights and other benefits.

Inadequate placement services. Jobseekers use of a variety of job placement services. They may go directly to a firm's employment offices; they may seek assistance from friends or relatives employed in a firm where they hope to work; they may use whatever services are available to them in their schools; or they may use private employment agencies or the public employment service.

The biggest problem of firms that do their own hiring seems to be getting suitable applicants who are ready, willing, and able to meet job requirements. Firms that do massive hiring cannot rely on friends and relatives of the workers to provide suitable applicants. Records show that the private employment agencies have cooperated with employers in accepting applications and making referrals in an obviously discriminatory fashion. This has limited the use of private employment agencies except where there is a great deal of job activity at the service or low income levels.

What happens in the public employment service offices is another issue. For many years it has been illegal for those offices to accept job orders that indicate a racial preference or to make referrals on a racial basis. However, many offices of the public employment service are themselves segregated, either by race or by job classification, and discrimination is practiced. The public employment service does its greatest disservice to Negro applicants where it exercises no initiative in developing additional job opportunities within the service itself or among its employer clients. There are, for example, very few Negro managers on the staff of more than 2,000 public employment service offices across the country. While some progress has been made, the service has a very bad image in many communities, and many skilled or professionally trained Negroes do not register with it at all. Failure to use the service and its facilities very often robs the Negro of an opportunity to expand his field of possible job prospects.

Underemployment. Discriminatory hiring practices have resulted in extensive underemployment, especially in many branches of the Federal Government. Not long ago a Government study of employment practices among several Federal agencies operating in the Southeast revealed that only two Negroes were employed in grades as high as GS–12 (both were race relations representatives with the Housing Authority), none at GS–11, one at GS–10 (a social worker at the Federal Penitentiary in Atlanta), and none at GS–9 or GS–8. A large group were GS–7's which included mailroom supervisors and messengers who had been working for as long as 20 years. Many Negroes working at GS–7 and below were college graduates, and some had completed many courses above the college level. Some changes have been made, but much more needs to be done.

Discrimination in Federal employment is magnified in the light of civil service regulations in effect since 1873, which specifically forbid discriminatory practices. There is little doubt that this regulation has been ignored during all these years. Even now, when a great effort is being made to do a more equitable job, it is possible to indicate at least 11 ways of ignoring the well-known "rule of three," even when all three candidates are Negroes. The only way to achieve real change would be to declare a moratorium on all Federal jobs until a more equitable pattern is developed and fairer proportions of Negro workers are employed at all levels.

Special Problems in White Collar Job Areas. Whatever the status of Negro workers generally, the plight of those who work in or aspire to white-collar jobs is even more serious. In 1961, 14.1 percent of Negroes, compared to 45.6 percent of others, were employed in skilled white-collar and professional jobs. Included in this 14 percent are those employed in segregated school systems and colleges in the South, and Negro professionals who serve Negroes mainly. The remainder, in the general labor force, is then extremely small.

More specifically, the ratio of Negroes and others was found to be:

- —for accountants and auditors, 3,662 to 463,934;
- —for architects, 233 to 28,813;
- —for dentists, 1,998 to 78,200;
- —for physicians and surgeons, 4,706 to 218,904;
- —for aeronautical, civil, and electrical engineers, 2,794 to 380,273.
- —In the area of business management, the ratio was 73,433 Negroes to 4,420,894 others, with 45,464 of the 73-odd thousand Negro managers listed as self-employed.

These figures prevailed in spite of increased efforts by employers during and after World War II.

In the area of private enterprise, we find that the Negro has made his greatest contributions in businesses that serve the Negro community—insurance, banking, and personal services. He is not a substantial participant in the overall business world because he qualifies as neither lender nor borrower of important monies.

When Negroes have an opportunity to participate in the overall economic development of this country, they are generally not given equal pay for equal work. That this difference in income has widened in recent years is reflected in the fact that today Negro workers as a whole earn only 53 percent as much as white workers, a drop of 4 percent since 1950. Also, 62.4 percent of Negro families earn less than $4,000, while 70.6 percent of white families earn more than $4,000. Among white-collar workers, college graduates as a whole may expect to earn $9,000 per year; but for Negro college graduates the figure is $5,400. Most Negroes, even in white-collar jobs, work at the lowest paying levels, and so far they have not had sufficient opportunity to work in as wide a variety of jobs as other groups.

Business, industry, government, labor, or education have not made full use of available manpower. In business there were, outside the Negro community, only one Negro corporation president, fewer than eight directors on major corporation boards, fewer than six vice presidents; and several of these deal with the "special Negro market." Most of us at the Urban League know personally all the Negroes who hold top-level jobs in industry and business, for there are not many.

In government, the situation presents a very dismal picture. Here fair employment programs date back 90 years; State and city ordinances guaranteed equal employment opportunities all those years. Yet, Negroes still hold few supervisory jobs in most government areas.

In higher education, other than in Negro colleges, we have not produced one president of a college or university, not one dean, and very few department heads. There are surprisingly few Negroes holding full professorships in major universities, and this is true despite the fact that Negroes have been graduating from these institutions for more than 100 years.

The opportunity to learn, to acquire meaningful experiences, to explore, to make mistakes and recover from them, to be a part of the whole and not just a segment, to be understood as having desires, aspirations, ambitions, and feelings for America has not typically been the lot of Negro citizens.

Lack of Community Concern. Motivation and stimulation of Negro youth are major responsibilities of the community at large and cannot be delegated to teachers and professional counselors alone. First, industry, business, government, and labor leaders alike must be made aware of the problems confronting the Negro worker and jobseeker; and, second, positive plans to bring about desired changes in the school and community must be developed and implemented. Counseling and teaching materials at all levels should be redesigned for teachers, counselors, and administrators to depict the true image and worth of the Negro in our economy.

Equally new and dramatic thinking on the part of parents is called for to motivate their children. A parent's own work experiences are reflected in the advice and information he passes on to his children; hence, it becomes doubly important that every effort be made to secure better jobs for adults.

Negroes should participate at all levels of policymaking and policy implementation—planning, advisory, consultation, operation, evaluation, and followup—in overall community programs, as well as those dealing specifically with the Negro and his employment problems.

Some Problems Created by Negroes

Failure to take full advantage of available resources. Some of the problems Negroes face in finding suitable work may be attributed to their failure to take full advantage of available resources. The number of State Fair Employment Practices Commissions has reached 25, and the number of municipal commissions is now more than 50. Although many of the Commissions do not have *real* authority for dealing with the problems they are confronted with, they report that they do not receive enough complaints from persons with genuine cases of discrimination or unequal treatment.

In most instances, however, the commissions require too much of the complaintant, with some of their procedures so complicated that they almost need a lawyer. While positive results have been produced in a number of situations, the major job is yet to be done. In addition to the power of investigation, persuasion, and counsel, these commissions need to be able to initiate investigations; penalties should be realistic and administered as soon as decisions are handed down; and they should have the authority to request information regarding progress in planning and executing fair employment programs. The Government should take immediate steps to cancel its contracts with businesses not complying with the intent and purpose of fair employment programs. State and municipal FEPC laws also need to be augmented by a Federal law.

Reluctance to move with plants that relocate in other communities. Despite their widely proclaimed mobility, Negroes are often not mobile, either at time of initial employment or when it is necessary to move with a firm which finds it necessary to relocate. For example, the Mack Truck Division of General Motors Corp. recently moved from its Newark, N.J., operations to Maryland, and not a single Negro worker has accepted a transfer. Despite the fact that many were making more than $125 a week in production shops, they have elected to remain in the Newark area and collect severance pay and unemployment compensation.

Lack of interest in pursuing careers in new areas of work. Negroes shun employment where income is based on commissions; they feel that they are being asked to produce with no guarantee of security or regularity of income.

Many opportunities exist in accounting, yet a recent check of the catalogues of 30 of the leading Negro colleges reveals that undergraduate majors in accounting were offered in fewer than 6.

Attitude of Negroes regarding "prestige" jobs and status. For many years and until very recently, Negroes were builders, chauffeurs, porters, coal shovelers, and nurses. These were the traditional jobs held by Negroes, the parents of today's youth. However, they saw the schoolteacher, the social worker, the preacher, all with personal status, all accepted by the community. These became their symbols of success.

As a result, the Negro told his children about the disadvantages of "hard work," "outdoor jobs," "seasonal work," "serving other people," "working with your hands," being "bossed by white people."

Teachers and administrators had little contact with workers, and unwittingly also helped develop negative attitudes toward manual and technical work. Available vocational programs provided training in limited areas, and technical offerings were virtually nonexistent. Vocational schools were used as dumping grounds for problem children and those who did not do well in English and mathematics.

Consequently Negroes today are not employed in skilled trades. While the need for professional, technical, business, and other white-collar jobs will increase in the years ahead, larger numbers of skilled workers will also be needed. Adults and youth alike would be wise to examine the possibility for achieving success in the skilled trades area.

Difficulty in getting Negroes to believe in changes. Many Negro youth simply do not accept the fact that changes are taking place, and that they are now at long last regarded as worthy of consideration for jobs at all levels in an integrated society. Part of the difficulty can be traced to parents who are still smarting from the evil effects of the situation just a few years ago. However, a really dramatic recruiting program conducted by management, coupled with improved counseling and guidance services at the school level, could change this quite rapidly. Young people do need more information about changes in the world of work and how to fit into this world. Educators and counselors must help youth explore opportunities made available through technological advances.

Status of Negro Women Workers. Negro women in the work force present special problems. Some must work to supplement the incomes of their husbands; others are the principal wage earners because there is no male head of the household. The percentage of Negro women who work is 45.6 percent, far greater than the 35.6 percent of white women. Unlike white women, however, Negro women are largely employed in low-paying jobs that make them vulnerable to unemployment and provide them with the least protection during illness, advancing years, and retirement. For example, 40 percent of all domestic jobs are held by Negro women. White women have priority of job opportunity over Negro men in many areas where Negro women never find employment; for example, in the transportation industry in such jobs as ticket sellers, drivers, and officeworkers.

Raising the status of Negro women who perform service work or other lower income jobs presents an almost insurmountable problem. There have been few efforts to organize these workers to give them leverage in raising wages, reducing hours of work, or setting standards of employment. Many of them know little about potential benefits through voluntary participation in the social security program.

In the many Negro families with working mothers the entire family can be together only on weekends. Where there is no father, boys are deprived of a male image and male counselor and companion.

3. Some Recommendations

The following recommendations represent sound and reasonable approaches to eliminating some of the problems. They are not listed in order of priority; however, basic to their development and operation is the elimination of segregated facilities and discriminatory practices relating to housing, education, health, and jobs.

(1) *A Public Works Program.* Because of the great need for roads, parks, highways, highway beautification, forestry, etc., a major effort should be made to develop and operate a federally financed public works program to make work available for low-skilled and low-trained people. Thus, needed jobs could be provided along with needed public facilities.

(2) *A Massive Basic Education Program for Adults.* Lack of basic educational skills is a major cause of unemployment among Negroes who are products of segregated and inferior schools. Such programs as those under the Manpower Development and Training Act, the Job Corps, the Neighborhood Youth Corps, and other federally supported efforts provide additional evidence of the inadequate backgrounds of many Negro citizens. Existing educational channels and persons responsible for everyday education are not likely to meet the needs of these Negroes. Needed is a massive program, federally or privately financed, or both, to identify the undereducated and train them to learn and earn under dignified conditions. Whether this takes place in a work or school setting will depend on the imagination and ingenuity of the program planners.

(3) *Scholarships and Educational Assistance.* Talk about educational programs is useless unless we understand that many of those who need such programs are not financially able to take advantage of them. Inasmuch as the income of Negro families is far below that of other American families, it is reasonable to assume that many Negro youth will, through no fault of their own, be denied the opportunity to acquire knowledge and skills. Needed is a gigantic federally or privately financed program of scholarships, financial aid, work aid, and other resources designed to assist youth from low and moderate income families to go to college. This recommendation in no way relieves public school officials of the necessity of continuing the present drive to update and upgrade all education from preschool through high school. Both are necessary.

Special consideration needs to be given to developing additional opportunities for post high school training and financial support for the families so that youth may be able to attend technical schools, junior colleges, etc. Vocational and technical education programs must be updated and improved so that the graduating product will, in fact, be a better product. Youngsters in these programs tend to come from families with less than middle level incomes, and the pressures to contribute to the family's maintenance are great. Accordingly, careful consideration must be given to providing these students with funds or jobs, whether on a half-day school and a half-day work basis, a week in and one out of school, or even through the development of programs that produce goods. It is difficult to recommend an out-and-out grant program for students of this level.

(4) *A National Home Building Program.* Traditionally, at least until the midforties, Negroes were the builders, carpenters, bricklayers, plasterers, and the cement finishers. But today construction is not sufficient to provide jobs for these people, and often union membership, which is closed to most Negroes, even dictates who will work on those that are available.

A federally and privately financed program to increase the supply of houses would provide thousands of jobs for skilled, semiskilled, and unskilled persons and at the same time would provide better housing, neighborhoods, and schools to thousands living in ghettos and slum communities.

A massive school building program financed with Federal funds is also recommended as one of the most effective ways of ridding the community of outdated school buildings and facilities which so often are the training ground for Negro youth.

(5) *Broader Support for Negro Colleges.* Inasmuch as 80 to 90 percent of Negro youths still attend the 100 predominantly Negro colleges, these colleges still carry the burden of providing higher education for Negro youth. However because all colleges get support from Federal grants, foundations, individuals, and alumni, Negro colleges are falling further and further behind other schools.

For example, the $464 million raised by MIT, Harvard, Princeton, and Stanford for development between 1960 and 1964 is more than twice the total amount raised and spent in all of the Negro colleges combined. The $80-odd million in Federal funds received by the University in California during 1964–65 also suggests that the Federal Government is a tremendous source of income for colleges. Funding for Negro colleges from Federal sources needs to be explored.

Demonstration programs have been carried on in an attempt to upgrade programs in Negro schools through participation in and attendance of students and teachers in cooperating integrated colleges. It is strongly recommended that these programs be reviewed and extended. While more students than teachers have been involved, we must seriously consider developing programs that will make it possible for teacher exchanges on a semester or annual basis, rather than the short limited periods in existing programs.

(6) *Improved Recruiting.* While both private and public employers have expanded their recruiting activities on Negro college campuses, much more needs to be done at this, as well as at the high school, level. General recruiting practices which include a wide use of testing and other procedures also need to be reviewed.

The combination of strengthening the curriculums in Negro colleges and developing realistic recruiting practices is a must if school staff and employers are to understand the role of each in the development of manpower. Those who teach and train Negro children need to have many more opportunities to be a part of the world of work. They may participate in research programs and community activities during the school year or during the summer or sabbatical periods. Exchange programs might be developed with persons from industry taking the teacher's places in the classroom while teachers work in industry.

(7) *Improved Health Facilities.* Inasmuch as Negroes have so many health problems, the simple availability of facilities and resources would probably go a long way in alleviating some of them. The 1964 Civil Rights Act should make many facilities available, but ongoing programs with a direct focus on the health and education of Negro citizens are needed at the community level to educate them to make the best use of them. It may even be necessary to take Negroes by the hand and escort them to health clinics. A stepped up program in physical fitness in the public school level is also needed.

(8) *Increased Work Experiences and Opportunities.* People seeking good jobs are expected to have some kind of work experience. Many Negroes, however, have always been denied the opportunity to work in good jobs. While many white youngsters have been able to work in stores, banks, and offices, Negro youth have had to content themselves with working in restaurants or on farms. The lack of experience or even the opportunity to work indoors has limited the vocational outlook of young Negroes, for people tend to make career choices on the basis of experience or lack of it. Therefore, a program is recommended to give Negro youth who stay in school the chance to expand their work experiences. While one of the purposes of the Neighborhood Youth Corps is to help youngsters stay in school, unless more experiences are made available for the "stay-ins" to balance the programs offered for dropouts, we will find that we have made it more attractive to be a dropout than a stay-in.

(9) *Improved Counseling Programs and Techniques.* Apart from needs in education and training, attention must be given to counseling, including job and occupational information. Negro youth need examples of success, of proof that staying in school and learning is in their own best interest. In addition, many counselors are unfamiliar with the background, aspirations, and implications of Negro youth. Many persons, both Negro and white, are responsible for assisting youth with vocational choices when they themselves lack the broad educational background and work experience needed to advise students. The counseling programs available under the National Defense Training Act should be reviewed and perhaps strengthened by adding or substituting counseling sessions or work experience for academic experiences; most of the present programs do not have such provisions. This will require the cooperation of business and industry, along with the Government and educational institutions, but with continued community interest it would be workable and in the best interest of all.

Remedial programs currently operated under Federal, State, and local auspices must be constantly reviewed to assure that old barriers do not reappear and that the people who should benefit in fact do. Omissions and shortcomings must be identified and immediate corrective measures must be put into operation. Better concepts should be developed. Members of the Negro community who have leadership qualities or who could be trained should serve on necessary committees and boards to develop and operate meaningful programs.

THE USES OF SYSTEMS ANALYSIS IN MANPOWER ADJUSTMENT

Prepared for the Commission
by
Technical Analysis Division
Institute for Applied Technology
National Bureau of Standards
U.S. Department of Commerce

CONTENTS

Page
Introduction ---------- III-149
I. Identification of some problems in systems control ---------- 149
II. The requirements for an integrated systems view of manpower policy ---------- 150
III. A conceptual view of the manpower adjustment/modeling the system ---------- 152
IV. Results of simulation analysis and implications for manpower policy ---------- 156
V. Some conclusions/some speculation ---------- 160
Appendix. A dynamic feedback simulation of manpower education and utilization ---------- 163

The Uses of Systems Analysis in Manpower Adjustment

Introduction

This 6-month study was begun in July 1965 under the joint sponsorship of the National Commission on Technology, Automation, and Economic Progress and the Institute for Applied Technology to determine if the current techniques available in systems analysis and operations research could be of positive benefit in planning and operating programs relating to manpower utilization and adjustment where such programs are the responsibility of the Federal Government.

In view of the time constraints, the approach selected involved an attempt to make one complete pass at a gross systems analysis oriented toward current systems problems. This involved (1) identification of systems components, (2) identification of objectives, constraints, key control variables, and suitable criteria for systems performance, (3) the development of a crude model simulating the system performance, (4) identification of alternative systems strategies for control and improvement, (5) use of the model to test and evaluate these strategies, and (6) evaluation of the results, assessment of model performance, and conclusions concerning the total effort.

The study was conducted by Gary K. Stonebraker, administrative officer of TAD/NBS, and Dr. Evelyn F. Murphy, economist, TAD/NBS, with valuable assistance, which is gratefully acknowledged, from Dr. Garth L. Mangum, executive secretary of the Commission, and Frazier Kellogg of the Commission staff.

I. Identification of Some Problems in Systems Control

The manpower utilization system of the United States is that group of institutions, businesses, and governmental bodies which:

1. Determines and defines the jobs required to produce the desired and needed goods and services for our society;
2. Trains and educates the required numbers of workers to fill these jobs and provides them with incentive to work;
3. Provides necessary information and mechanisms to match these jobs and workers in a productive and balanced environment;
4. Assures that all parties in the system preserve their rights and liberties while maximizing action in the national interest.

The job formation system as defined includes industry, government, and all forms of employers or self-employing enterprise, bodies of laws and social constraints acting to regulate terms of employment, labor unions insofar as acting to determine jurisdiction of labor and the use of skills, and other elements determining the existence and composition of jobs.

The skill formation system includes schools and educational institutions at all levels, vocational and training schools, adult education and retraining programs and institutions, and a large complex of informal mechanisms for education and acquisition of skills.

The job/worker pairing system includes information systems, employment services, hiring mechanisms, employee and job evaluation systems, a host of decision mechanisms, and other elements.

The production environment includes the collection of buildings, tools, employee services, and accessories required to allow work and to support the worker, as well as bodies of constraints and regulations controlling the quality of this environment.

The strong interdependence of this system and its components with other systems in the society is well known, and its own interdependence with itself, i.e., the dependence of one component in the system with others, is well known and heavily studied in the world of economics and other disciplines. For instance:

(1) The job-worker pairs will produce goods and services to satisfy demand;
(2) Depending upon how well this is done (factors of productivity, prices, performance value, etc.), new demand and new kinds of demand are generated;
(3) These, dependent upon the level of demand and options for the use of technology, will maintain, increase, decrease, or regenerate demand for labor;
(4) All of these things act to affect the value of labor, and hence wages and income, hence consumer capability;
(5) Which affects demand, etc.

The total system affecting how, when, and where manpower will be utilized is extremely large and complex, reaching deeply into processes of law, education, public policy, technology, social and ethical tradition, and many other areas of great complexity. It is not surprising, therefore, that a system of such great complexity will sometimes behave contrary to human desires, producing unemployment, underemployment, labor shortages, inflation of wages, unfair labor practices, and many other undesirable effects.

When these phenomena occur, it becomes desirable to adjust conditions in the system or to adjust the behavior of the system in whatever ways practical and possible to eliminate these effects. In fact, it is the stated responsibility of the Federal Government to use all of its resources within the limits of its power and discretion to prevent or eliminate these "system imbalances" when they occur. Adjustment, in this case, implies balancing the system behavior with current national goals, as well as with other individual and social objectives.

The Government's principle options exist in the form of (1) constraining actions, such as fair labor practice laws, minimum wage acts; (2) remedial action, such as programs for retraining, employment services; and (3) provision of incentive, such as programs of information encouraging higher education, subsidy of education, tax incentives, and employment information services.

However, when the Government begins to act in any of these areas, it must recognize the complex interaction of the entire system before it takes action in any specific area, because policy in that area cannot and will not act independently of the status of the rest of the system. Thus, proper planning for full utilization of manpower, for policies or programs which can seriously affect the manpower system, including plans for education, for uses of technology, and for all the other areas mentioned must be coordinated toward a single set of objectives.

In order to coordinate policy properly, the operation of the entire system must be viewed as a single interaction of these many aspects and policies of manpower, and the system must further be viewed as a dynamic interdependent system constantly in motion through time, always capable of acting contrary to expectations.

The behavior and action of such a large system is too complex to predict and understand fully without the aid of special analytic tools designed for the job.

It is the major hypothesis of this report that systems analysis provides such tools which lend increased capability toward understanding the complexity of the system.

II. The Requirements for an Integrated Systems View of Manpower Policy

Let us now examine the hypothesis of the integrated systems view of manpower as a necessary part of proper policy planning by examining each element of the hypothesis singly:

1. The entire system must be viewed as an entity because of the dependence of one part of the system upon the others.

For instance, a goal of balanced labor supply and demand requires (among other things) that at any given point in time, the number of workers occupying each critical skill class closely matches the number of jobs requiring that skill class or mix of skills. If this condition is not met, then the system is bound to encounter either unemployment, labor shortage, underemployment, or overemployment, with regard to skill criteria.

But the number of workers in any skill class at any particular time is a function of the rate of output of the many processes which develop skills, which influence occupational choice, and which influence other choices. That is, whether or not the requirement is met depends upon whether we are training enough workers to replace those we shall lose, whether we are educating them to the proper levels, whether proper incentive to choose that skill class exists or not, and so forth.

Whether or not this match of numbers and skills exists at any given point in time is therefore a function of the processes of education and training prior to that time. Thus, our current rates of education and training, plus the status of all the other factors which will influence decisions to work in an area or to open a job in an area, are in fact now determining whether or not this balance will exist at some point in the future.

2. The entire system must be viewed as a dynamic interdependent system, because the results at any point in time are dependent upon the relative rates of motion and change governing the processes in the system.

As an example, let us, for the moment, draw an oversimplified relationship between output, demand for labor, and productivity:

$$\text{demand for labor (D)} = \frac{\text{required output}}{\text{productivity}} = \frac{O}{P}$$

Let us now suppose that we are considering change from the current mix of 1,000 units of output, 100 units of labor, and a productivity factor of 10 to some time in the future when we predict that the required output will be double the present level, or 2,000 units, and the labor force will increase by 50 percent to 150 units in that same time. We shall clearly require a new level of productivity of 13.333 units if we are to have the required output, full employment, and no labor shortage. If over the time period of the change, productivity does not increase by the expected amount, we will encounter labor shortages, or, if it increases by more than that amount, we shall not be able to utilize the full labor force without increases in demand or reductions of productivity.

However, we also need to observe that if, in the period of transition from the first state to the second, the rates of change of productivity are not balanced, there will be interim short-term imbalances in the system as well. These may be just as serious or perhaps more serious than any deficiencies or imbalances at the end of the period of transition.

Thus, even if the final objectives for the system are properly coordinated, there is still the need to be concerned about coordination of the action leading to those new goals at every point in time during the transition. Otherwise, the costs of change may be more than the benefit of reaching the new goals in terms of temporary losses, displacements, and so forth.

3. The entire system must be viewed as a dynamic system in order to assess properly the consequences of action at the present time, and in order to be able to predict the response of the system in the future to changes in the present.

The manpower system exhibits many of the characteristics of feedback-type control systems, and correspondingly the concept of dynamic feedback may be a useful way to view the self-correcting and response mechanisms built into the system. For instance, let us take the simple example used before, and consider a situation in which the "employer" begins to encounter labor shortages in moving from the initial state to the new state. He may decide on the basis of continued shortage to install "automated equipment" to increase productivity. The consequences of this decision, without fail, will feed into the determination of future labor demand in a long-term and perhaps irrevocable way.

In the larger system, the examples of feedback principles in operation are numerous and complex; some of the feedback responses are short-term and quickly effected; some of these responses are much longer-term and difficult to recognize, such as the gradual upgrading of education or slight but long-term increases in productivity due to the pressures of expanding technology.

Thus, in establishing properly coordinated policy it is necessary to determine and predict how a particular decision will affect other spheres of interest . . . and how, in turn, response decisions in that sphere of interest may feed back into our original area of concern.

Not to make such considerations is to invite serious losses of control, to reduce the reliability of prediction, to invite conflicting action from elsewhere in the system, and to reduce the effectiveness of policy and planning throughout the entire system.

4. Even having considered all of these factors, there is still the problem of alternative policies for moving from state A to state B.

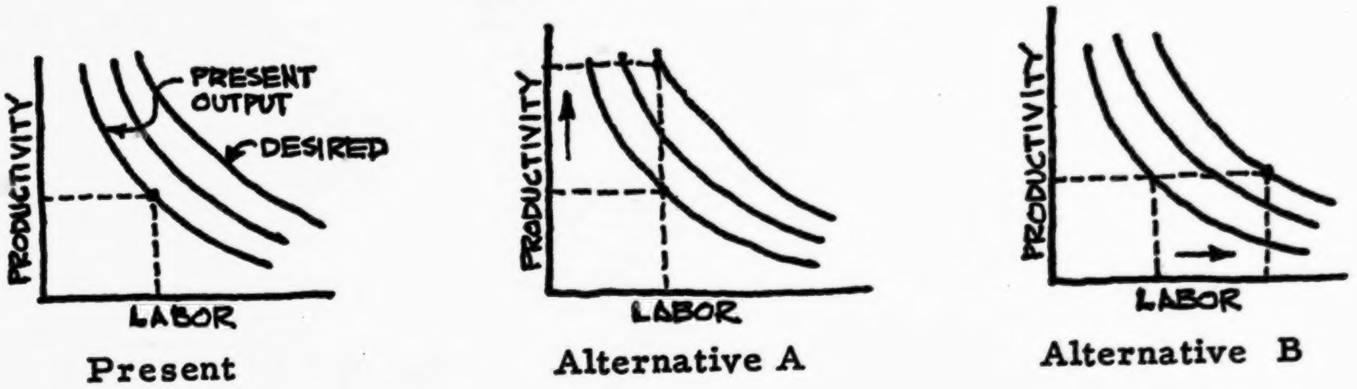
Returning once again to the simplified problem example used previously, let us remove the constraint on labor force growth and consider that we have some ability to influence the rate of growth of the labor force. We might now choose from a host of alternative ways of doubling output, as exemplified in the following graphs. (The horizontal axis represents the number of man-hours of work used per unit time; the vertical axis the level of productivity; the series of curves are levels of output. Each point along a given curve specifies a combination of labor and productivity which would result in that output.)

At one extreme (fig. 1), we might elect to hold the labor force constant and increase output through productivity increases only. At the other extreme, we might do just the opposite, holding productivity constant and increasing output through expansion of labor only. Or we might do any conceivable combination of the two, not considering real world constraints on change of either factor.

Each alternative which we can visualize from these examples is quite likely to have a different "cost" to the Nation and its people.

These costs must be reckoned in terms of investment, losses of opportunity, cost of education,

FIGURE 1. *Alternative Strategies*



changes in profits, and many other factors, too numerous to mention here.

For example, the choice of increasing output largely through productivity means that the costs will include cost of new investments in plant and equipment, or, depending upon whether current technology is adequate to provide the new productivity, added costs in research and development. It may result in lowered employment, increased pressure on wages, and other kinds of costs.

These costs would be quite different than those incurred if we elected to expand output largely through added labor. This alternative would result in increased demand for education and training facilities, perhaps some costs in increasing labor force participation, indirect losses incurred by reduced demand for R. & D., and so forth.

It is obviously desirable for stable expansion of the economy and for maximized growth that the "least-cost" set of policies achieving the same results always be used. This requires consideration of all costs throughout the entire system. (See goal-cost alternatives.)

These, then, are the kinds of problems which face the policymaker and the operative in coping with manpower problems now and in the future. We shall now examine how systems analysis might approach such problems and what results it might yield.

We should make clear at the outset that 6 months of study are not adequate grounds for positive conclusions either about the nature of the problems or the full utility of systems analysis. What we do wish to accomplish is to provide insight into its capabilities, the problems associated with its use, the complexities it can handle, and the nature of results it may yield.

It is a tool and nothing more, and as such it requires development, acquisition of skill in application to specific problems, investments in its growth, and tolerance of its shortcomings. It does not and will not have the power of decision, but rather serves to increase the horizons of those who do make decisions to increase their understanding of problems and to open new options of choice.

Goal-Cost Alternatives

$$\left.\begin{array}{l}\text{rate A1}\\ \text{rate B1}\\ \text{rate C1}\\ \text{rate D1}\end{array}\right\} = \text{GOAL A} = \underline{\text{COST A}}$$

$$\left.\begin{array}{l}\text{rate A2}\\ \text{rate B2}\\ \text{rate C2}\\ \text{rate D2}\end{array}\right\} = \text{GOAL A} = \underline{\text{COST B}}$$

$$\left.\begin{array}{l}\text{rate A3}\\ \text{rate B3}\\ \text{rate C3}\\ \text{rate D3}\end{array}\right\} = \text{GOAL A} = \underline{\text{COST C}}$$

III. A Conceptual View of Manpower Adjustment/Modeling the System

This study will attempt to demonstrate the utility of systems analysis both as:

1. A research tool which helps identify the nature of system behavior, which might suggest priorities for added research, and which help suggest new courses of action, new programs, and new organizational patterns.
2. An operational tool, which helps policy coordination, which helps analyze policy effectiveness, and which can provide useful cost-effectiveness information.

As support in this demonstration, a limited partial simulation model has been developed and tested. Because of time and money limitations, this is a crude aggregate model which of necessity oversimplifies many important elements of the system. Because of the model's limitations, results cannot and should not be taken as conclusive. Its principal utility is, as will be seen, in providing insight into the nature of problems rather than in predicting the positive outcome of events.

To avoid complication of the body of this report, only a brief outline of the model is presented here; a detailed report of the simulation model and its program, as well as illustrative results, are provided in the appendix.

In order to construct the model, it was necessary first to develop a conceptual view of conditions of employment, i.e., conditions which result in the matching of a worker with a job in a satisfactory manner.

The view developed attempts to classify jobs and worker so that they may be paired in corresponding subsets which may then be compared numerically for "balance." In order to accomplish this, each job and each worker in the system are described as a list of characteristics. For each characteristic, each job and each worker own in fact a particular value for that characteristic. A partial example of such lists follows:

Description of job	*Description of worker*
location of job	location of worker
skills required	skills possessed
proficiency required	proficiency possessed
experience required	experience possessed
age preference	age of worker
race preference	race of worker
wages offered	wages desired or required
minimum education required	educational attainment

As examples of values attached to these characteristics, we might describe a job as: Chicago, drill press operator, 5 years experience, etc. Each of the values may also have attached to it some tolerances, such as "Chicago or vicinity, 30-mile radius" and so forth. If the list is sufficient in detail, the probability of employment may be assessed with fair accuracy by assessing and comparing corresponding values on each list for similarity.

With this basis, the total set of jobs and workers may be subdivided into subsets of jobs and workers with similar characteristics to any desired level of specificity and detail. For example, we may describe and number the labor force in the following ways:

all males

all males age 34–45

all males age 34–45, drill press operators

all males age 34–45, drill press operators, Negro, greater Chicago, currently employed . . .

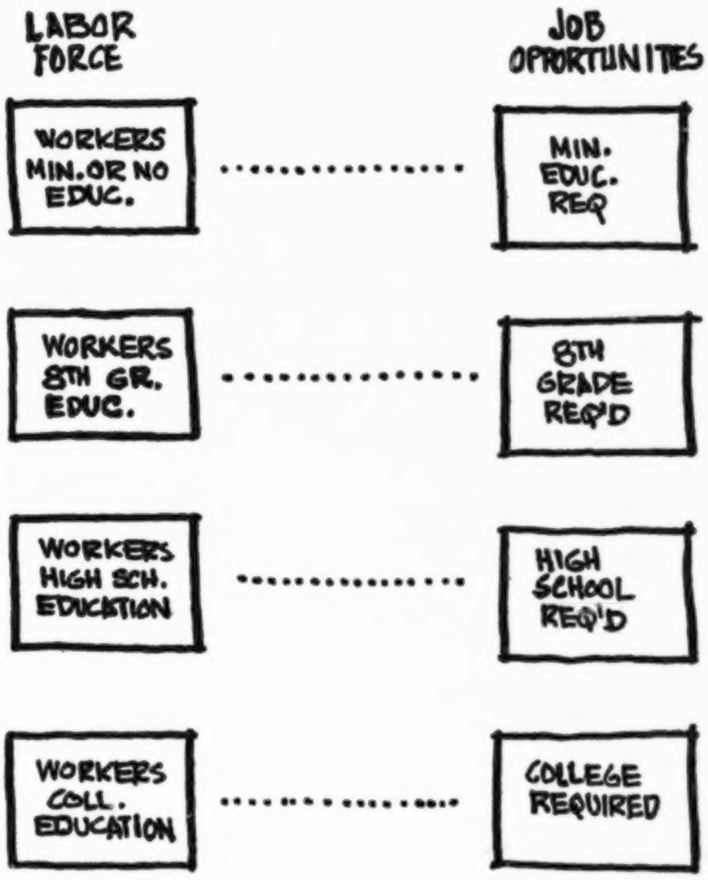
All persons or jobs possessing those characteristics may then be defined as belonging to the defined subset.

While this may be somewhat tedious, and it is not suggested as fully practical or possible, it does provide a somewhat more solid base for the construction of a model.[1] From this base, we may move back to modeling the processes which determine the particular values on a list at any particular time, and which therefore contribute to the balance, or lack thereof, between a list owned by a job and by a worker.

The model presented here oversimplifies this conceptual view and concentrates on examining the aggregate system balance with respect to only one of the characteristics mentioned in the list. The characteristic selected is level of educational attainment. The development of the model is presented in figures 2 through 5.

The construction of the model begins with the representation of all jobs and workers as four subsets: Those workers having achieved the college attainment level and those jobs having that attainment as a normal associated requirement (directly or indirectly); the corresponding sets for high school attainment, for eighth grade, and for all others below that attainment level. (These represent those levels at which statistics indicate differentials in attainment corresponding to the greatest differentials in wages earned by the worker.)

FIGURE 2. *Generation of Labor Force and Job Opportunities*



The "labor force," or sets of workers defined this way, are drawn from a "general population not in school," which is correspondingly divided according to levels of attainment. Entry to the labor force is through a "decision to seek work" (see later). Controllable upward and downward flow channels are provided between the labor forces to represent lack of clear boundaries or lack of clear perception on the part of "fringe cases" concerning what level they are actually qualified for.

The "general population" is in turn generated by a birth rate which adds persons to the system; this "new population," after suitable delays, is passed through an "educational system," which is also represented as four levels of attainment. After completing each level, the new population faces a "decision" to continue in school or to leave school to enter the general population. In this model, this decision is controlled to represent current retention patterns of the population (which, in the course of simulation, may be upgraded or downgraded as desired). Population is also extracted from the system by the application of appropriate mortality rates.

On the other side of the system, a general demand for labor is generated by observing the desired level of demand and dividing this by a "productivity index" which represents a generalized relation between labor force and output of the sys-

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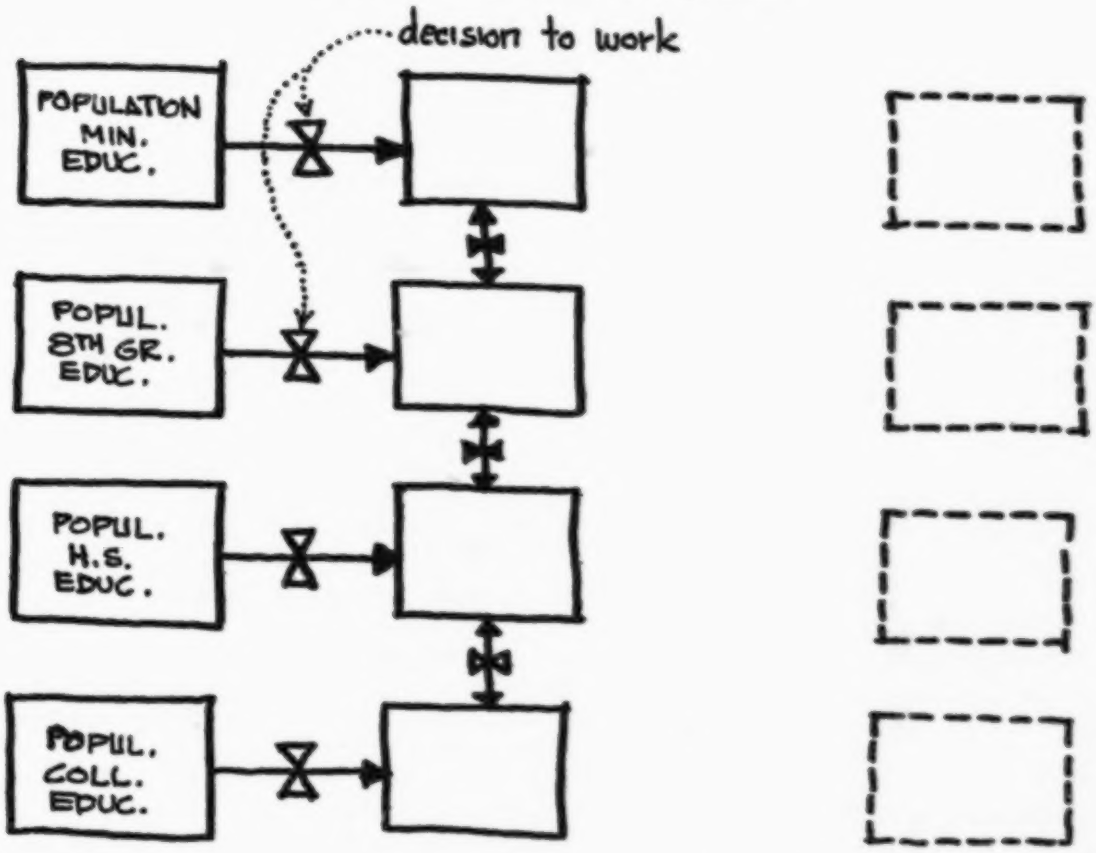
[1] The concept also provides some interesting ways of looking at decisions for employment and hiring through the formation of self-perceived lists, their projection, and reception by the opposite party, with consequent opportunity for noise and distortion of information, feedback modifications of lists, and so forth.

FIGURE 3. *Generation of Population*



tem. (See appendix for the discussion of assumptions involved here.) This "total demand for labor" is then allocated to each of the four levels of attainment according to a set of allocation rules explained in the appendix.

This completes the description of the major features of the model. In the runs, the criteria for performance of the system will be (1) the state of balance between sets of jobs and workers, and (2) the level of system output.

Each of the fundamental rates of flow in the system, e.g., birth rate or growth of population, death rate of population, educational retention rates, demand for labor changes or rates, changes of productivity, labor force participation rate, can be controlled externally in the model. But such control would serve little purpose other than to generate dubious statistical projections. We are interested in the way the system decides to make changes in its own behavior—voluntarily, involuntarily, with what information, in what particular manner, and with what consequences. On the basis of information gained and behavior observed, we would like to see how the performance of the system may then be changed or improved, and then to test those alternatives.

The most obvious kinds of imbalance we may pose as problems for the system to counter are simple imbalances in number of jobs and workers at any level or all levels, which the system is to counter without regard for cost. These kinds of imbalances include:

1. Aggregate shortage of labor and imbalances in the mix of workers and jobs by level of attainment,
2. Aggregate surplus of labor, or
3. Local surplus or shortage of labor

To counter these kinds of imbalances, the following strategies, among others, are available (and, in fact, represent strategies or policies now under consideration by the Nation):

1. Aggregate shortages of labor: (a) Increase of labor force participation, presuming skills available but not working; (b) increase of productivity to counter general shortage.

2. Aggregate surplus of labor: (a) Increase of aggregate demand which presumably indirectly increased demand for labor; (b) reduced participation, i.e., encouragement of those not needing work to leave the labor force, (c) potential reductions in productivity.[2]

3. Local shortage or surplus of labor: (a) Job restructuring, or the shifting of demand from areas of shortage to areas of surplus, (b) localized changes in participation rates.

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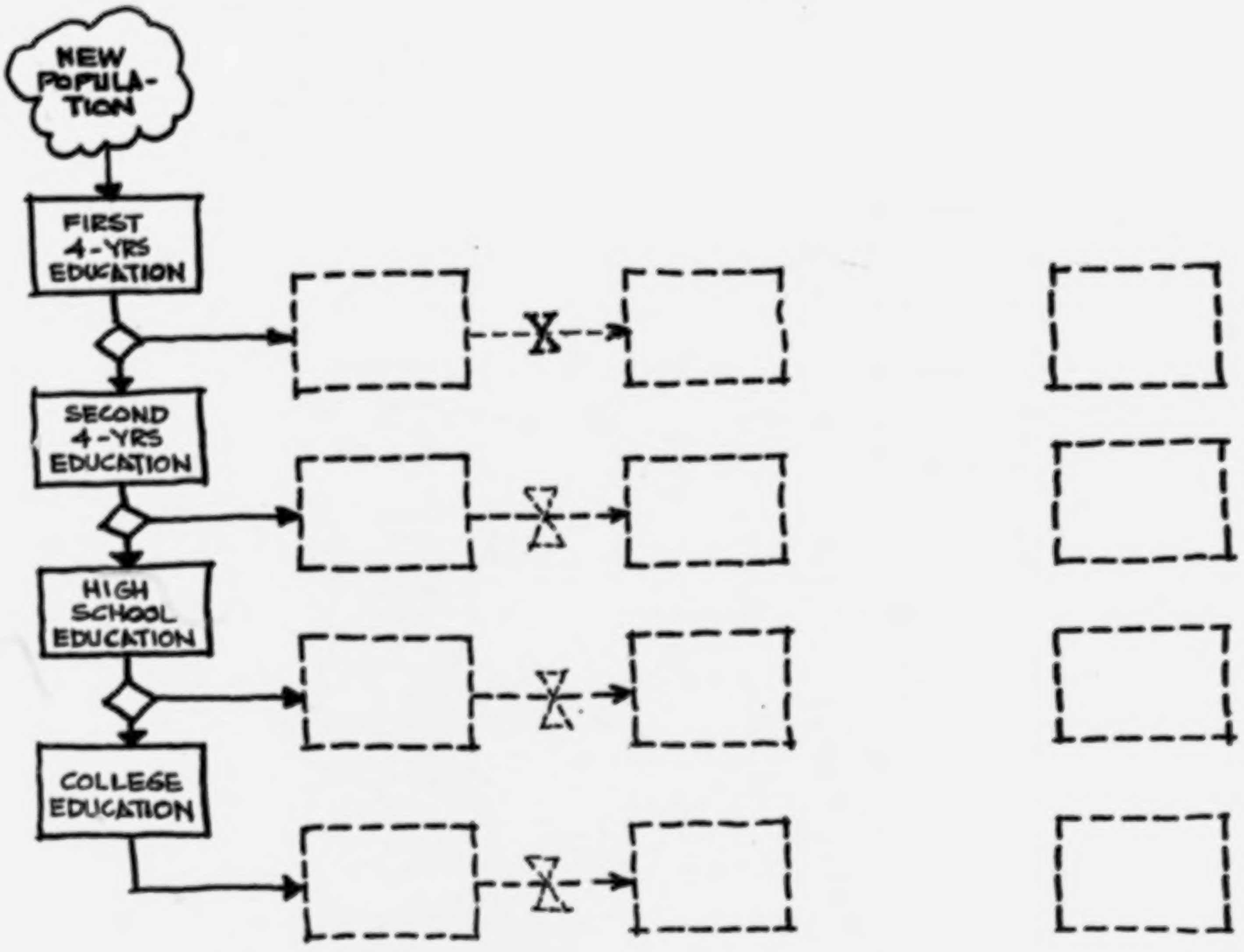
[2] This is unlikely, since industry does not typically replace processes or install new ones that are less efficient than existing ones (the "ratchet-effect" of technology and productivity).

FIGURE 4. *Education Sectors*



In summary, four major alternatives that we shall select to represent are:

1. Changes of labor force participation,
2. Increases in aggregate demand,
3. Changes in level of productivity, and
4. Job restructuring.

Representing these four alternatives, the model was expanded from the basic flow model previously explained to include feedback-type control systems, which monitor the status of the system and then attempt to balance the system through corrective action.

While operating, the simulation is placed under various conditions of constraint against different demands upon the system, singly and in combination with other strategies.

These feedback control systems operate as follows:

1. Perceiving aggregate labor surplus, the system will calculate the required increase in aggregate demand at the present level of productivity, and will then act to institute that increase where constraints on the amount of increase permissible will allow the increase to take place.

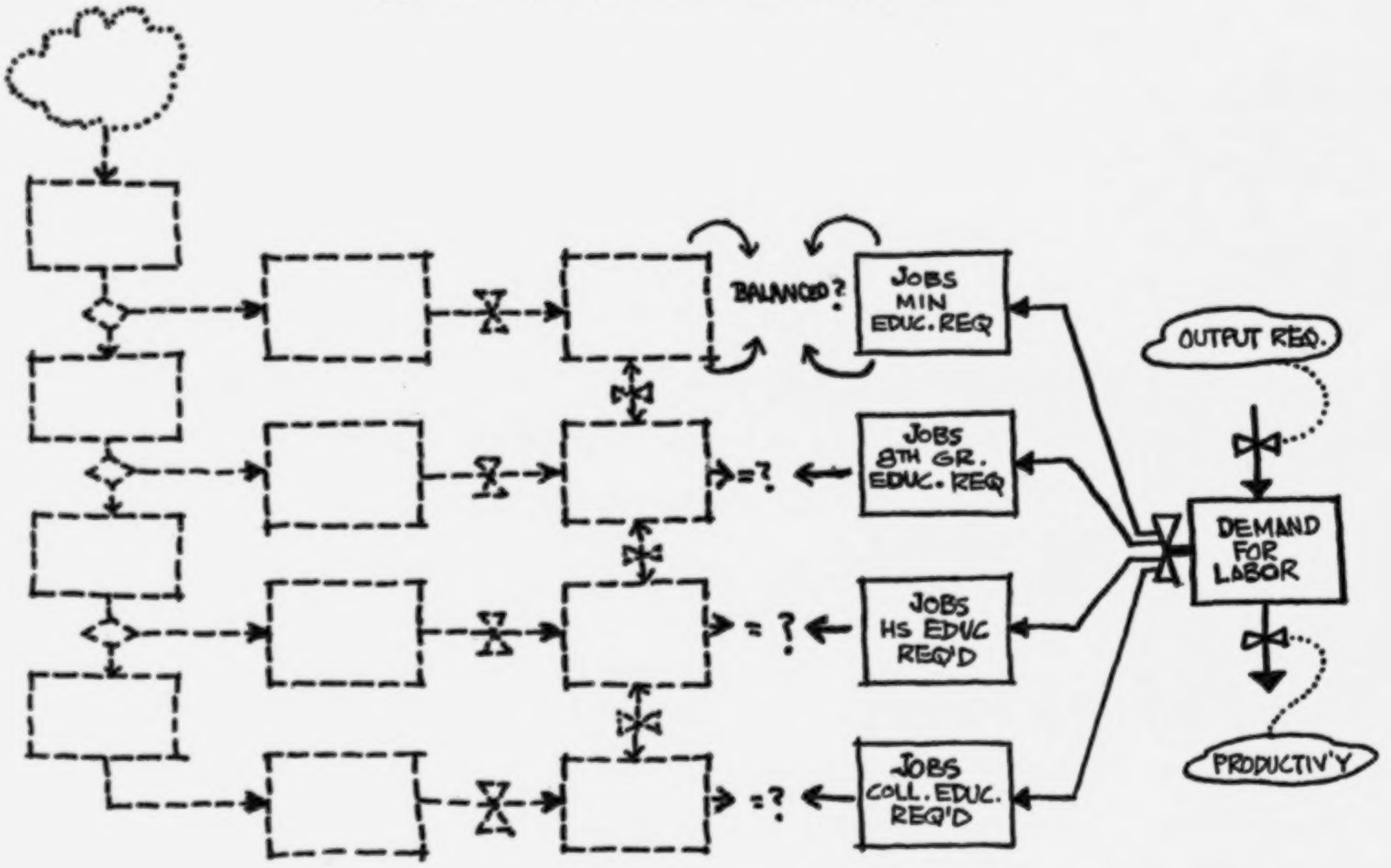
2. Perceiving aggregate labor shortages, the system will act to compute the required amount of increase in productivity to provide the desired output at current levels of demand and labor supply. The calculated increase will be delayed in reaching the system, representing delays in acquisition of plant and/or equipment.

3. Population will respond with variable sensitivity to supply/demand information and information on specific numbers of opportunities (or lacks thereof) in making decisions to enter or leave the labor force. They do so within participation rate constraints which set limits on the range over which participation may vary.

4. To combat localized surplus or shortage of labor, jobs will be reallocated, with variable delay, to equalize the supply/demand ratio in each of the four sections of attainment represented.

Discussion of the modes of representation of these control systems and the obvious assumptions

FIGURE 5. *Demand for Labor and Levels of Attainment*



involved is contained in the appendix. Each of these control mechanisms can be constrained, varied in efficiency of response, or cut out completely through the use of systems control variables in the simulation.

Another important condition of the inclusion of these control systems in the model should be pointed out:

First, each of the systems acts independently, with no knowledge of what any other control system in the model may be doing simultaneously except for what information may be inferred from the results of previous decisions. The model is, therefore, a "no-coordination" system at the outset.

Second, the control systems are "reactive" instead of predictive; that is, none of them do any forecasting, but, rather, attempt to make corrections to perceived imbalances in the system after the fact.

Both of these conditions are acknowledged as perhaps somewhat unrealistic, but nonetheless are necessary as a basis for evaluating the benefits of subsequent additions of coordination and forecasting. The results will, under these circumstances, emphasize the ways in which conflicts can develop in the system and will help to point out exactly what kinds of improved performance are gained by the addition of various improvements in operation.[3]

IV. Results of the Analysis of the Simulation and Implications for Manpower Policy

In the course of the study, the model became well enough developed to allow some 140 analytic runs.[4] These runs developed a wide range of tests on various constraints, experimental hypotheses, and strategy combinations. The total output of these runs is well over 1,000 pages of numerical information and graphs, far too much to present meaningfully in a report of this nature. Therefore, only the results gained, brief insights into the cause of various interesting effects, and some brief conclusions are presented here in the main body of the report. Selected output is presented in the appendix.

In the first group, 82 runs were attempted, using various combinations of policies interacting with various systems constraints. Examples of the constraints imposed were minimum and maximum rates of growth of demand or changes of productivity. For instance, since at no time in our history has productivity increased more than 5 to 6 percent in a single year, a maximum rate of change of 10 percent per year was imposed in some runs; likewise, since there have been few years with no change of productivity, some runs were programed to provide an automatic minimum increase of 2 percent per year regardless of the need for such changes based on labor shortages. All runs were made against identical population growth patterns, but some runs varied the educational retention rates to provide a different population mix.

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[3] Expansion of the model to include forecasting and policy coordination features is underway at the time of writing this report, but are not available for inclusion at this time. A subsequent report will be issued as work continues, probably not later than April 15, 1966. This will provide comparisons of model performance with the addition of various control facilities.

[4] The model was programed for the NBS IBM 7094 electronic computer; see appendix.

The results indicated, in summary, are:

1. None of the strategy combinations that the model was capable of representing balanced the system for more than very short-term periods.
2. None of them showed much improvement over the unemployment patterns experienced over the last 10 years or so.
3. No single strategy was capable of controlling the system independent of the others or independent of system status.

Obviously, the first question that springs to mind is the validity of the model itself. Did it produce such results because it failed to take all the factors into account or because it failed to represent the factors in question accurately? This is always a possibility, and one must always consider the results relative to the model structure. Until we are absolutely sure of the model, it is dangerous and presumptuous to depend upon the quantitative results, but the qualitative results are subject to analysis.

Observing some particular effect, it is possible to look back into what specific effect in the model caused that result, and then to extract from parallels with our real world experience to see if we can identify similar real world phenomena. Frequently, this act alone is the most fruitful result of systems analysis because it leads to fuller appreciation of problems through the emphasis of new relationships.

In addition, qualitative results are often valid enough to identify the relative importance of one element in the system to others. Answers to such questions as how important some element of information might be, can frequently be shown as the result of qualitative differences in performance.

Thus, at this stage, presentation of results will avoid, because of obvious reliability problems in the model, discussion of the quantitative differences in order to emphasize that there is utility even in unreliable, incomplete data bases. As the unreliability element is reduced through experience and through expanded data bases, the utility should only increase.

The following paragraphs discuss the utility and limitations of each of the strategies:

1. *Uses of productivity to offset labor shortages.* This particular strategy proved to be most subject to the constraints imposed upon it and to particular systems conditions. The most noticeable effect of this particular policy was its propensity to "overshoot" in increases of productivity. It instituted larger changes of productivity than actually required under its directive to offset current labor shortages.

This is easily explained in terms of the model. Productivity increases are calculated on the basis of current deficiencies, and instructions are given to institute that amount of increase. But the increase does not actually become effective in the system until some two or three time periods after the decision. This delay represents lags between decisions to boost productivity and the actual acquisition of new plant and/or equipment required to change productivity. In this interim period, the labor shortage may persist, and additional productivity increases, combating the same shortage, will be called for because the decision rule does not take into account what is "in the pipeline"; i.e., those changes in productivity already instituted in the system by past decisions. This could be simply rectified in the model.

But since productivity changes do tend to occur in isolated ways in the economy in response to localized conditions and are not seen in the aggregate until they actually appear, the use of policies to encourage or discourage the use of productivity might also be subject to precisely the same effect. In order to counter this, the system requires proper forecasting procedures which account for productivity changes that will occur at some time in the future as a result of technology now implanted in the society but not yet fully taking effect.

It is also observable that the degree of miscalculation encountered with this policy is variable with the length of the delay between decisions for increase and the time at which the change is fully realized. As this delay increases, the importance of forecasting, or taking into account what is in the pipeline, becomes significantly more important.

Thus, an important measure for the priority of forecasting systems can be observed. If we could look into each subsector of industry determining the average delay in productivity change lag times, we would have some notion of which sector the activity of forecasting might have most importance. This becomes vitally important where the training of manpower requires long lead times, and is in itself highly dependent upon proper forecasting of needs.

2. *The strategy of job restructuring.* This particular strategy proved to be an indispensable part of any system strategy, since, in fact, under any simulation circumstances, some change of the mix of population by levels of educational attainment

is inevitable. Thus, if redistribution of jobs, i.e. the changing of education requirements, is not a part of the system strategy, there will either be overemployment or underemployment if not unemployment in almost every level. The most common situation observed would be that of underutilization of highly trained persons.

In all of the runs, it was interesting—and predictable—to note that the shift of the population mix toward higher levels of education caused "shortages" of workers at the lower attainment levels and "surpluses" of workers at the higher attainment levels if the mix of jobs remains unchanged from its present utilization patterns. This is simply because we now educate a larger percentage of the population to higher levels; even if we now stopped upgrading education, the mix continues to change into the future for some time. This means that more highly educated workers will become available; if more jobs requiring those skills do not emerge, these persons must work at jobs below their full potential. There are many ways to interpret this: First, we might view this as a condition requiring that new demand for labor be channeled selectively into the highest areas of growth accompanied by moderate restructuring of jobs at the lower levels.

More interesting, however, was the fact that this particular "shortage-surplus" condition was singly the result of (1) the delays built into the model in restructuring jobs, and (2) the fact that aggregate demand was not adequate to provide full employment during these observed conditions. In the model, restructuring is accomplished in the following way: First, the distribution of the labor force by educational attainment is averaged for the past 4 years. (This tends to smooth out short-term perturbations, but also tends to provide a built-in data lag where growth rates are high.) Next, the disparity between the distribution of demand and the distribution of the labor force by levels of educational attainment is noted. This disparity determines the redistribution of jobs. The required redistribution is instituted and delayed in such a way that about 75 percent of the required restructuring is accomplished in two time periods. This method moves jobs from the lowest-growth areas to the highest-growth areas, in our case into the "high school" and "college" attainment levels. Thus, as long as aggregate demand is deficient, and since the restructuring of jobs lags the requirements, there is always a "surplus" of workers at the upper two levels of attainment.

This, however, is contrary to our experience, since, in fact, our greatest surplus of workers is at the lowest levels of attainment in the real world. In order to correlate the observed behavior of the model with that of the real world, we need to add the following assumptions:

(a) that an employer will, regardless of requirements previously imposed, always hire a better-educated worker if he can get him, and
(b) that workers in situations of shortage are at least in part willing to be displaced downward one level (let us presume between 40 and 60 percent are so willing).

When built into the model, these factors of displacement displaced persons downward throughout the entire system, pushing the "poorest-educated" workers out the bottom of the system. It was also interesting to note that the residual distribution of surplus workers across the spectrum of attainment levels was remarkably similar to the real-world distribution patterns.

This entire phenomenon was also caused by another important constraint, namely, limiting the minimum participation rate of the labor force.[5] At first, the "surplus" of workers in the high attainment areas "decides" to leave the labor force on grounds of lack of opportunity. But soon the participation rate is at its minimum level, simulating an unwillingness of persons remaining in the labor force to leave due to pressures greater than the pressure of supply/demand (e.g., income requirements, etc.). From this point onward, due to lags in restructuring, the supply of labor leads demand by an absolute number of

$$\text{surplus} = \text{labor force growth rate in sector} \times \text{delay in restructuring}$$

(In lowest growth sectors, this is the approximate relation of the worker shortage.) Given the constraints used in the model, this surplus could be moved between 3 and 10 percent of the labor force in the sector in question.

Thus, by interaction of dynamic change in the system and delays in the system response, manifestations of frictional unemployment are observed. We also observe that in order to eliminate these effects, there would be two alternatives which could be tested in this model. The first would involve the raising of aggregate demand to the level where there was an aggregate shortage of labor, in which case balance might be achieved in some, but not all, sectors; the second involves the installation of a forecasting system in the restructuring mechanism which must look far enough ahead so that restructuring can begin in advance of its actual need. But this alternative means that jobs may be moved out of areas where they are currently needed in order to meet future needs, which will also produce some immediate imbalance or aggravation of existing imbalances. A third alternative, which could not be tested in the current model, may avoid both of the pitfalls of the first two. This is the selective channeling of demand increases into growth areas, which in the long-term changes the job mix without destroying or changing any of the existing jobs. All three alternatives, however, point to a need for proper and precise prediction of the future distribution of the labor force, a task which is now underway and ongoing. What may not be currently evident is that it is industry, or those who provide these jobs, that needs the information.

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[5] The participation rate is constrained between ±3 percent of the recently (since 1945) prevailing rate of 57–58 percent; this constraint was imposed in view of the stability of real-world participation rates.

3. Expansion of aggregate demand. Strategies using the expansion of aggregate demand proved to be an inseparable part of system control. They were, however, wholly dependent upon simultaneous uses of restructuring, since demand in this model is not channeled selectively into areas most requiring additions of demand for labor. In addition, the effectiveness of demand strategy was seriously constrained by (a) the imposition of constraints on the growth rate, representing some saturation in the ability of the economy to expand, and (b) the constraints acting upon, and general behavior of, the "productivity" decision mechanism.

The glaring deficiency was once again the lack of forecasting. As mentioned before, the model control systems are "reactive" in lieu of being "predictive." Thus the expansion of aggregate demand was undertaken only in amounts adequate to bring employment to a full level for the current time period. By the time this change was instituted one time period later, both population and productivity have changed, changing in turn the requirement for aggregate demand. The addition of a forecasting mechanism would have easily eliminated this difficulity; but this forecasting system, unlike the productivity forecasting system, would be concerned with elements in the system other than itself. In fact, it would have to predict accurately the status of population, labor force participation, and productivity simultaneously, a much more complex task.

The simulation did lend some valuable insight at this point to a potential shortcut in the forecasting of requirements for aggregate demand, at least in terms of the model itself. One of the factors calculated in the productivity decision was a "desired productivity," which would be that productivity level which for the given labor force and level of demand would result in "full employment." In situations where there is surplus labor in the aggregate, this factor of "desired productivity" will be less than the actual existing level of productivity; thus no productivity increases are called for. The interesting factor is that under conditions of labor surplus, the lag of desired productivity behind actual productivity is a direct measure of the deficiency of aggregate demand. And whereas other measures in the system, such as the actual level of the labor force, can be quite unstable, the "ratchet-effect" (see later) built into productivity changes tends to smooth them out, making a more stable indicator of system conditions. Thus, instead of taking the obvious approach to forecasting and measuring the status of the entire system, the simulation helped to locate a useful indicator which could serve as the basis for a simplified forecasting technique. Tests of this forecasting technique will now be incorporated into the model expansion.

4. Strategies of change in labor force participation. These strategies, which tend to increase the response of the labor force to supply/demand information in situations of imbalance, proved to be the most destabilizing influences of all those tested. This was not due to the inherent characteristics of added mobility, but rather to the fact that this change precipitated serious information problems in the model.

In the early runs, the participation rate of the labor force was allowed to vary only 3 percent up or down from the initial level, which was based on current participation rates. This tight constraint of the labor force was based on statistics indicating that in the real world, the labor force participation rate has held steadily between 56 and 58 percent of the over-14-population since about 1950 (and earlier).

One of the obvious implications of these statistics is that decisions to seek work are based on factors other than opportunity or lack thereof; these tend to override even long-term shortages of jobs, i.e., unemployment. These factors, therefore, led to the inclusions of the tight constraints in early simulations; they also, in turn, were directly accountable for much of the surplus or deficit of labor encountered at various points, and thus it was evident that it might be useful to relax these constraints.

In the simulations where these constraints were relaxed, the participation rate was allowed to vary 10 percent around the initial rate as opposed to 3 percent. Within these limits, the population responded to an absolute number of opportunities (or lack of opportunity) with a variable pattern of overresponse or underresponse based upon supply/demand pressures. This decision structure will be discussed later; at this point we need only observe that the problem we are about to discuss is independent of this pattern of response.

In the early runs, as observed before, the participation rates quickly ran up against constraints and tended to stay there. Changes in labor force levels, therefore, directly followed changes in the population, which are relatively smooth. Since decisions concerning productivity, demand, and distribution of jobs are based in part on this labor force level, the constraints acted to provide a stable information base which reflected true growth trends. When the constraints were relaxed, the labor force levels no longer reflected this stability and long-term growth, but move cyclically around long-term trends in spurts of short-term behavior. Without one of the elements in the system stabilized by external constraints, the total operation of the system became relative only to its internal status. Thus, with no base for decisions, the system began to "hunt" and "wander," acting in a very conflicting manner internally. It continued this behavior until it encountered some extreme imbalance, then responded to counter that imbalance, with the momentum of that response carrying it to some other extreme, to which it responded, which carried it to a new extreme, and so forth.

Thus we encounter evidence that some decision rules operate effectively only so long as certain constraints or system conditions are maintained. What the model required in this new state was an entirely new set of decision rules, information systems, and so forth, in order to be able to maintain stability. In the particular case, the appropriate additions would have been a "master decision rule" which had programed objectives and which monitored the status of the entire system, computed the alternative mixes of action which could restore balance, and then selected an appropriate strategy against a set of criteria, such as system costs or the like. From such computations, directives would be issued to each of the available control mechanisms on the degree of action it should take.

We wish to be very careful, in conclusion, not to imply on the grounds of this analysis that any strategy is good or bad, better or worse, or to make any other such conclusions. We only point out that such matters must be judged relative to system conditions, constraints, and objectives for the system, and that all conclusions must be made in a relative manner for the entire system. This, as we have mentioned before, will require the development of new sets of aids for the decisionmaker, and these brief insights into the techniques of systems analysis should, we believe, point out its utility along these lines.

V. Some Conclusions/Some Speculation

Conclusions. Systems analysis, as we have presented it here, is a mode of thought which simply expands the frame of reference in which decisions are made to the "systems level," i.e., to include all the necessary considerations of the factors that can deter an action from its objective. Having done this, it tries to lend some added precision to that mode of thought through the development of both qualitative and quantitative methods of analysis capable of handling large systems of complex variables. This study has used only one of the tools (and used it crudely), namely simulation, to attempt to illustrate these factors. Simulation, in the long term, may or may not be the appropriate tool; others, such as linear programing, gaming, or analytic models, may also be useful for different kinds of problems.

The decisions to be made at this point are not which techniques should be used, but simply whether the total concept of systems analysis holds enough promise to warrant further work on its application to this problem. Following a decision that it would be useful, it would not be fair to expect it simply to spring into being. To develop the systems concept to fruition, substantial investments must be made in study of the problems, identification of objectives, criteria and constraints, and the development of simulations and other tools to the point where they are at least partially if not wholly reliable. This requires a willingness on the part of the policymaker and other sponsors to make investments in time and money for developing tools and building capability.

This development work must also be approached carefully in order not to outline programs of work that are beyond our resource capabilities in systems analysis. One sensible first step would be the continued exposure of concerned parties to the concept on a working, participating basis by which they can become capable to judge for themselves the utility and the limitations of systems analysis. Continued development of the model presented here, with the participation of a limited group of concerned operatives from fields of labor, economics, education, and other areas, may be a practical first step in this direction.

Some Speculation. Results gained from this simulation led to some thought and speculation of some interest, and which we felt might be brought to light firmly identified as speculation. Two such courses of speculation are presented here.

The first involves one of the assumptions built into the model, namely that against the criterion of educational attainment, the job requirements curve-fit to the available supply. In most instances, the current theory holds that the labor force tends to curve-fit to the job requirements. Thus this assumption runs contrary to experienced opinion at this time. This hypothesis is based on the observation that there must be substantial delay times built into decisions by the population to alter its skills and other characteristics. Thus, industry is not capable of setting job requirements independently of the existing skills of the population or without regard to how much they might upgrade those skills through self-operated training programs. This leads to some added thought on the uses of technology in industry; one may speculate that where a sophisticated requirement exists, advanced technology may be used to "break down" or alter that requirement into a series of less complex requirements which can be filled from the existing labor pool. As an example of this, the scarcity of computer programers during the recent rapid expansion of the use of the machine is continuously being offset through the introduction of less complex "user-oriented" programing languages which allow persons unskilled in programing to use machines for special purposes. The real programing talents are used to develop these new languages, i.e., in the reduction of skill requirements for the use of computers to match more closely the abilities of the potential users.

Probably the truth of the matter lies in some combined curve-fitting, where both industry and labor may be visualized as moving toward some "imaginary curve" which represents a compromise between the desires of industry for skill structure and the current capability of the population. Any of these three assumptions is acceptable in the model, for all three cases will produce about the same surplus/shortage phenomenon discussed in section IV under the "strategy of job restructuring." We can visualize that if industry, instead of labor, sets the standard to which the other side adjusts itself, so long as there is any delay or lag in the adjustment, this phenomenon would still occur. It would also occur if both sides are adjusting to some compromise standard. The entire phenomenon is dependent upon delays in system adjustment, rather than on who is adjusting to whom.

The question of who adjusts to whom is important in the sense of knowing which way to do the forecasting. This raises a major point of speculation. So long as more than one alternative way of explaining the phenomenon of frictional displacement is feasible, there is some question about the utility of forecasting schemes.

One possible reaction to this speculation is simply to believe that you can prove anything you wish with simulations so long as you are willing to make the right assumptions. There is probably some truth in this. It is at this point that the simulator returns to the realities of the world with a rude awakening. He finds he is in large measure dependent upon judgments about the real world in providing the proper base assumption for the model. But in spite of this, the simulation may have served its purpose in presenting some alternative solutions back to the policymaker for judgment. The policymaker, then, must decide on the validity of the assumptions based on the evidence presented, and if he cannot, then a good case is built for further research in the area for the gathering of further data and other action.

Another speculative output of the simulation involves the way that decisions to participate in the labor force are represented. The structure of this decision is reviewed in the appendix, and since understanding of it is important to the following discussion, it is suggested that at least that part of the appendix be reviewed by the reader.

When experimentation with the labor force response curves was undertaken with tight constraints placed on the labor force, the shape of the curve proved to be more or less irrelevant. That is, the labor force could be overoptimistic about job opportunity, pessimistic, or anything else, and it did not seem to matter much to the model performance. What did matter was when imbalance was introduced into the response curve; i.e., when the labor force increased more in response to a level of shortage than it decreased in response to the same level of surplus. This would be analogous to a condition where when a new factory opens in an area, some persons who do not normally work decide to go to work; but when that factory shuts down or lays off, they then remain in the labor force and appear on the rolls of the unemployed. When the model operated within the 3 percent limits on participation rate changes, the effects of such imbalance did not show up. However, relaxing those constraints allowed this imbalanced response to cause some cyclic behavior in participation. In response to slight increases in demand, a supply of workers in excess of that needed to fill the new jobs flowed in. They, of course, did not flow out again with equal rapidity, which created a surplus, causing the system to boost aggregate demand. These boosts crossed over the needs of the labor force now diminishing slowly in response to oversupply; this caused an artificial shortage, labor once again overresponded, and, as they do, the changes in productivity took hold and caused downturn in demand, generating another labor surplus, and so forth.

Speculative conclusions lead to some observations about the relative importance of research on the labor force. They suggest that prior to major investment in determining precisely the supply/demand opportunity response of persons outside the labor force, one needs to determine (1) if other constraints, such as economic necessity, are so overriding that people simply cannot decide not to work; and (2) the degree to which these constraints tend to fix participation. If it appears on the basis of such research that conditions could be generated where wide excursions of participation might be encountered, then, and only then, would it be necessary to know the precise degree of variation in response for purposes of forecasting. In turn, this investigation need only begin through determinations if persons are either optimistic or pessimistic in dealing with decisions to join or leave the labor force in such a way that they enter more readily than they leave, or vice versa. Further, the degree of accuracy required in such knowledge is clearly limited by other systems conditions and behavorial characteristics.

This discussion is obviously oversimplified, as many other factors of local and structural response must be taken into account. It nonetheless is perhaps interesting as a demonstration of how less speculative results might lead to the firmer structuring of programs of investigation into the system through the establishment of priorities on levels of information required to be able to predict systems behavior.

APPENDIX

A Dynamic Feedback Simulation of Manpower Education and Utilization

The model used for exploration and simulation in this study was developed and programed by Gary K. Stonebraker and Dr. Evelyn F. Murphy of the Technical Analysis Division of the National Bureau of Standards. The model consists of approximately 350 equations programed in DYNAMO,[1] a special user-oriented simulation language viewing the world as being composed of closed-loop feedback systems which control flows into, out of, and between various "levels" or aggregations of objects in the system. The levels are represented by sets of difference equations. DYNAMO is currently programed for IBM 7090–94 computers; some conversions for the 1620 are also in existence. DYNAMO was selected as the programing language principally because of its ease of use and excellent diagnostic and output programs, which allowed a working model to be constructed in a minimum amount of time. DYNAMO consists of a series of fixed-format statements providing basic mathematical capability and some special-function subroutines; this proves to be rather cumbersome if a lengthy detailed representation of a system is desired, but was very adequate for the aggregated model and general level of detail envisioned at the outset of the project.

The complete program listing for the basic functions of the model is presented at the end of this appendix. Some of the original program is deleted, but only those elements which were initially inserted as crude frameworks for additional contemplated expansions to the model. If the reader encounters an occasional undefined variable in the program listing, it will probably refer to one of these deleted sections.

Structure of the Model

The model consists of the following parts: (1) population generation; (2) educational flow system; (3) population not in school; (4) labor force; (5) labor demand generations; (6) labor allocation sector; and (7) adjustment mechanisms. Each of these elements will be discussed singly.

Population Generation. Population for the total system is represented by a level equation (POPUL) which is controlled by a birth rate (GRPOP) and a death rate (DRPOP). The birth rate at any time period is taken as a percentage of the existing population by multiplying the existing population by a control constant (KGPOP). The death rate is computed in the same way, as a percentage of the current population level, using the multiplier (DEATH). This multiplier is a "ramp function," meaning that it can be increased or decreased linearly through time. The amount of increase or decrease from the initial level is controlled by the parameter KCDER.

Flow in Educational System. The amount of growth in the population in each time period is stored in a "train function," a special function for storing a particular value. (Each storage position in the train is addressable in sequence, and by specifying that each new value be shifted down one position each time period, the program is able, for instance, to pick up a value generated "n" time periods ago by addressing the $(n+1)^{th}$ position on the train list.) This new population is stored for 22 time periods, which provides a running total on population by age through age 21, neglecting attrition.

The educational system itself is divided into four levels of attainment representing the first and second 4-year periods of elementary school, high school, and college (STUE1, STUE2, STUHS, STUCE). The new population figure stored in the train function (BXPOP) is delayed 5 years and then used as the entrance rate to the first level of education. This entrance rate is then stored four time periods, and then applied as an "exiting" or graduation rate in the form of an output of the level. Meanwhile, the next highest level of education (STUE2) is determining its entrance rate by monitoring the population "9 years old" (BXPOP*10) and multiplying that population figure by an educational retention rate, which is a control constant (PCEN5). This control constant may also be varied linearly during the simulation; the rate of change from the initial level is specified by the control constant KCPE5. This is also true for the other retention rates PCEHS, PCENC. Thus we have x percent of the population starting in school, y percent continuing to the next level, z percent to the next, and so on, where z is smaller than y, y smaller than x, representing dropout.

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[1] *DYNAMO User's Manual*, 2d ed., Pugh, Alexander L. III, MIT Press, Cambridge, Mass., 1962.

General Population. The output of the educational system in terms of dropouts, or graduates, provides the input to the four levels representing the "total population not in school" (excluding those under 5 years of age). The general population is also represented as four-level equations corresponding to the four levels of attainment defined (POPE1, POPE2, POPHS, POPCE). When a group of persons drop out of school after completing a certain level of education, they are added to the general population level corresponding to their highest level of attainment. These input rates (PLSE1, PLSE2, PLSHS, PLSCE) are determined by computing the difference between the output rate at one level of education and the input rate at the next level one time period later. Due to the structure of the model, there is a one time-period delay in the addition of dropouts to the population.

It is necessary to reduce each of these population levels to represent attrition in each time period. This act is accomplished by observing the death rate computed for the total population (POPUL), and allocating this to each sector of the population in proportion to its size as a percentage of the total of the general population. This procedure induces some distortion in the size of each group. It does not observe that as the population mix shifts from one sector to another, the average age also changes, which would require the use of differing death rates in each sector for improved accuracy. This procedure tends to make the observed shifts in population less than they might in fact be.

The population in the student sector (i.e., the population of each educational level) is also higher than it should be because attrition in this sector is disregarded. The delay in accounting for dropouts tends to offset this error, since the population is always expanding. The net results for all population accounts compare favorably with current Bureau of Census and other projections.

Labor Force. The labor force is represented as four-level equations: LFPE1, LFPE2, LFPHS, LFPCE. These classify the labor force according to levels of educational attainment defined earlier. Each labor force is drawn from its counterpart general population level. Initially, the level of the labor force is set equal to the percentage of the population actually participating at these levels according to current statistics.

Changes in this initial level are provided by the single input of equations CPSD1, CPSD2, etc. The sign of the value of that equation (+ or −) determines whether the input is, in fact, an addition or subtraction to the labor force.

This value is derived from a supply-demand information system, which makes the actual change in participation a function of (1) the actual surplus or deficit of workers as an absolute number; and (2) a supply-demand ratio which indicates the relative severity of that numerical imbalance. Response to this information is dictated by a "table function" which specifies the percentage of the desired response that will actually take place. This output (NSEN1, NSEN2, etc.) is a function of the computed variable of the supply/demand ratio (BXSD1, BXSD2, etc.). (The supply/demand ratio is computed into a storage train to facilitate experiments in delays of information reaching the general population.) This table function represents an experimental "supply/demand sensitivity response" curve, and facilitates experimentation with various hypothetical curves. Because of its experimental and tentative nature, constraints are provided which can reduce or eliminate its effect.

The actual movement into or out of the labor force is arrived at by computing the difference between demand and supply, which determines the required response for perfect balance of supply and demand. This figure is multiplied by the output of the table described above, i.e., the percentage of that response which the labor force or general population will in fact provide. This result is multiplied by SDSR1, SDSR2, etc., a simple multiplier added to allow skewing of the curves of response. By specifying a value of 1 for the control constants KOSJ1, etc., and KOSW1, etc., the output of the decision will simply be as directed by the table function; values of other than 1 are those by which this output is multiplied to determine the final rate of change. The KOSJ series are multipliers for situations of shortages of workers, and the KOSW series for surplus situations. Thus, for instance, if one wished to specify that the response of persons moving into the labor force was twice that of those exiting, the KOSJ factors would be set at 2. These multipliers are used to express the same general patterns of response at various levels of optimism or pessimism on the part of the general population and labor force. (The multipliers KOSJ and KOSW are inputs to a "switch function" whose output is SDSR; the "switch function" is an if-then subroutine which uses one value when the supply/demand ratio is greater than 1, the other value if it is less than 1.) (It should be noted that this same effect could be generated by simply substituting another table function of the desired proportion and ignoring these control constants; this route was elected since the punching of tables tends to be cumbersome in the format provided and is a ready source of errors.)

Finally, this desired change in the size of the labor force is compared to the maximum flow in the desired direction of change which can be allowed before the actual participation would exceed the specified boundaries. These boundaries are set at the upper limit by the control constants KMXP1, KMXP2, etc., and at the lower limit by KMNP1, etc. The absolute value of these constants is the decimal fraction of the labor force which can participate; i.e., values KMXP1= 0.55, KMNP1=0.35 would specify that at the lowest attainment level, participation may vary between 35 and 55 percent of the general population at that level. The changes in the labor force are always constrained so as not to exceed these limits. By setting the maximum and minimum levels constraints equal, participation is fixed at the specified fraction of the population. By setting the constraints close together, the supply-demand movement is severely constrained (the 3-percent tolerances used in most runs literally negated all supply/demand movement.)

Samples of some of the response-curve tables used in experimental runs are included at the end of this appendix.

Demand for Labor. Demand for labor in the aggregate is represented as level equation DEMLB. This level is controlled by a single input equation RCDLB, in which once again the sign of the value + or − determines the net effect on the level. Changes in the level of demand are determined by computing the desired level based on current levels of productivity indices (NXPDY) and output levels (OUPUT). This desired level is compared to the current level, and the difference is taken as the rate of change for the next time period.

The level of productivity NXPDY is set initially as the quotient of the starting level of demand for labor and system output, and thus is a relative system index not directly related to any real ratios of productivity. It is controlled by a single rate equation RCPDY. This rate is computed by calculating a desired level of productivity for full employment (DESPY). The minimum rate permitted is zero change, i.e., no negative changes are allowed. Thus any positive difference between the current level of productivity and the desired level is fed into the system. (This provides the "ratchet-effect" on productivity change.)

This change, however, is delayed in affecting the input rate. The required change is fed into a storage train BXCPY. The rate RCPDY is constructed by multiplying the contents of the four storage positions in the train by four mulipliers, KCPY1, KCPY2, KCPY3, KCPY4. These multipliers specify the percentage of the required change that occurs the first year after the decision, the second year, and so forth, up through the fourth year following the posting of the decision. Thus it is possible to specify any shape of delay curve in accomplishing productivity changes. For example, in most of the runs the productivity changes were instituted at the rate of 20 percent the first year, 60 percent the second year, and 20 percent the third year. Obviously, the sum of the four multipliers should not exceed 1, nor should any of them be larger than 1, or more than the requested productivity change will result. This delay is constructed in a manner not typical of DYNAMO models. This method was chosen to permit additions of anticipated forecasting schemes, as well as to permit introduction of different kinds of delays than provided for by the special functions of DYNAMO.

The level of system output represented by the level equation OUPUT is, as the model now stands, a representation of required or desired output. The initial level is taken at the 1960 value of GNP. Each time period, a new desired level of output is computed based on the level needed to provide full employment, i.e., balanced supply and demand. The difference between the current level and the new desired level is noted, and the difference multiplied by KMDCO, a multiplier. The output of this equation is taken as the rate of increase for the next time period so long as the output is a positive number. Negative changes in demand are not permitted. This is an arbitrary constraint to prevent the system from nosediving in a manner contrary to the intentions of this element. In future expansions of the model, a section calculating the actual probable output of the system is contemplated, against which this desirable output can be compared and reduced if necessary. The multiplier KMDCO is provided to represent conservatism or optimism in changes of the goal level of output. This is a point of future linkage to other policy constraint sections contemplated.

The rates of change of both productivity and output can be constrained through the control constants KMXIO and KMNIO (for output) and KMXCP and KMNCP (for productivity). These constants are percentages (expressed as decimal fractions) of the current levels of output which can be instituted as changes. Thus, for instance, if the constant KMXIO is set at 0.10, this means that no rates of increase in desired output in excess of 10 percent per unit time are permitted. If the control constants for maximum and minimum rates are set equal at a desired value, this effectively cuts out all feedback to that sector and constrains the rates of change to a specified preset value. For example, if KMXIO and KMNIO are set at 0.05, this automatically sets the rate of output growth at 5 percent per year independent of system conditions. Thus it is possible to set these factors at "goal rates" to see how the system must otherwise respond to meet these goals. The same is true for the productivity constraints KMXCP and KMNCP.

Allocation of Labor. The total demand for labor, DEMLB, is multiplied by four decimal fractions NPDL1 . . . 2 . . . H . . . C, which represent the percentage of the total demand which will be allocated to the four levels of demand by educational attainment. These levels of demand are represented by the auxiliary equation DEME1, DEME2, etc.

Restructuring of this allocation is accomplished by computing the current distribution of labor force, as a percent of the total labor force (CPSL1, CPSL2, etc.). The value is stored for each level (BXSL1, etc.). The 4-year average distribution of the labor force is computed from these stored values (DDLS1, etc.). This is compared to the present distribution of demand by computation of the differential. In the next time period, the current percentage of demand for labor in each sector will be modified by one-half of that differential (or by whatever fraction is specified by the control constants DRJE1, etc.). (The use of four separate multipliers DRJ allows the specification of differing restructuring at each level.) This restructuring decision obviously involves a number of basic assumptions in addition to the question of who curves-fits to whom. First, there is the question of whether one job moved out of one sector must be transformed into more or less than one job in another sector, i.e., the question of differing productivities at different levels of ability. Do a clerk and a computer really equal an accountant? We have obviously sidestepped this whole issue on the grounds that there is not sufficient basis for the decisions that may be required to resolve the issue. The long-term evidence, at least to this date, suggests that while there may be significant changes in the numbers of jobs due to relocation of jobs or restructuring, there are countering effects which tend to maintain the aggregate number of jobs in an equilibrium position with the overall supply-demand base. Thus, while failure to represent this effect surely induces some error, it is hard to judge the severity of that error.

Second, there is an obvious need to be more specific concerning the translation of aggregate demand for goods and services into specific kinds of demand for labor. This consideration is high on the list for expansions of the model. The major constraint to earlier inclusions of this feature was a lack of data linking the utilization of skills by educational attainment levels or other criteria to specific industry groups. While data are available giving detailed statistics on the labor force by the major "occupational" groups, no comparable data were found showing the utilization of these "occupational" groups by major industry group; e.g., in manufacturing, what is the use of semiskilled, skilled, technical/professional, and other occupation-classified labor groups? Were these kinds of data available, it is not difficult to visualize a model where demand is generated in sectors for which specific productivity, capital investment, and other kinds of pertinent data are available.

Adjustment Mechanisms

In the foregoing description of the model, the control systems used for representing strategies of internal compensation have been outlined; in summary, they include facility for (1) upgrading of aggregate demand to levels required for full employment; (2) increases of productivity to offset aggregate labor shortage; (3) experimental control of participation rates; and (4) adjustment of demand for labor to match supply distributions.

Data Used in Simulations

The data used in these runs were obtained from the following sources:

1. *Population:* U.S. Department of Commerce, Bureau of the Census, *1960 Census of Population* and *Current Population Reports.*
2. *Educational statistics:* U.S. Department of Health, Education, and Welfare, Office of Education, *1965 Digest of Educational Statistics.*
3. *Economic data:* U.S. Department of Commerce, Office of Business Economics, *Survey of Current Business.*
4. *Employment and labor force:* U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings;* and other statistics as presented in the *Manpower Report of the President, 1964.*

Values for the initial values in the simulation are listed in the program listing which follows and are identified as N-type equations under the appropriate acronym; e.g., the initial value for total population is listed as: 6N POPUL=180. Values are listed in millions of persons throughout.

Model Validation

The model has been validated only to the extent that results, such as population projections, agree statistically with available projections in a reasonable way. Since it is not at this point the intention of the model to produce quantitative results but rather to provide insight into the potential uses of simulations, further validations have been restricted to comparisons as to whether the results appeared reasonable in comparisons to what projection data may exist concerning the future of the economy. Thus the model as it stands in development today still requires other than face-validation. Its principal value for the present period of development is as a learning ground and test-bed for evaluation of hypotheses used in model expansion. It will be quite difficult to evaluate the model's performance in terms of validation and sensitivity analyses until the expansion of the model provides facility for the comparison of at least two sets of internally generated results, such as population, labor force, and demand. Since these factors are still largely exogenously controlled, the only kind of validation now possible is statistical validation of questionable utility.

Selected Results

Because of the enormous volume of output and the problems of presenting and reproducing output rationally, only selected results will be presented at this time as being representative of output leading to the discussions and observations in the main body of this report. The data will be presented in form of graphs which are duplications of DYNAMO-generated output. The original graphs contained additional plotted output which tend to make them somewhat confusing, and so the presented graphs are recopies of these originals with the extraneous data deleted.

The bottom axis of the graphs (x-axis) is time, representing a period of 50 time units or 50 simulated years. The simulations were extended to this length in order to allow adequate time to observe small accumulating behavioral differences, and not as an attempt to predict 50 years into the future.

The vertical scale (y-axis) represents either millions of persons or percentages as noted. Again, the reader should not take the numbers literally, but should only use them to compare one result qualitatively against another.

In addition to this graphically presented output, every run produced printed records of the exact value of 109 equations at each time period during the progress of the simulation. These printed records are not included because of a desire to keep the volume of the report to a minimum as contrasted to their potential for adding useful information.

In addition, only selected graphs will be presented to provide a cross-sectional view of the simulation results. These graphs will be presented in the following order for each run:

1. *Labor Demand by Levels of Attainment (plotted cumulatively)*: The graph presents the demand for labor at each sector of attainment during the course of the simulation. These figures are shown cumulatively, i.e., one graph line is plotted with the next lowest one as its base. Therefore, perturbations in one line will reflect themselves in all the lines above that line on the graph, and some sectors which are in fact growing stably will appear to be moving unstably if this is not taken into account.
2. *Labor Supply:* The effective labor force by levels of educational attainment is also plotted cumulatively and therefore subject to the same effects as described above.
3. *Supply and Demand, High School Attainment Level:* This is a profile of one particular sector showing supply and demand curves superimposed for that sector.
4. *Levels of Output and Productivity:* This shows the relative levels called for by the control mechanisms in attempts to adjust the system.

The results of four runs, labeled 9200, 9206, 9230, and 9223, are presented.

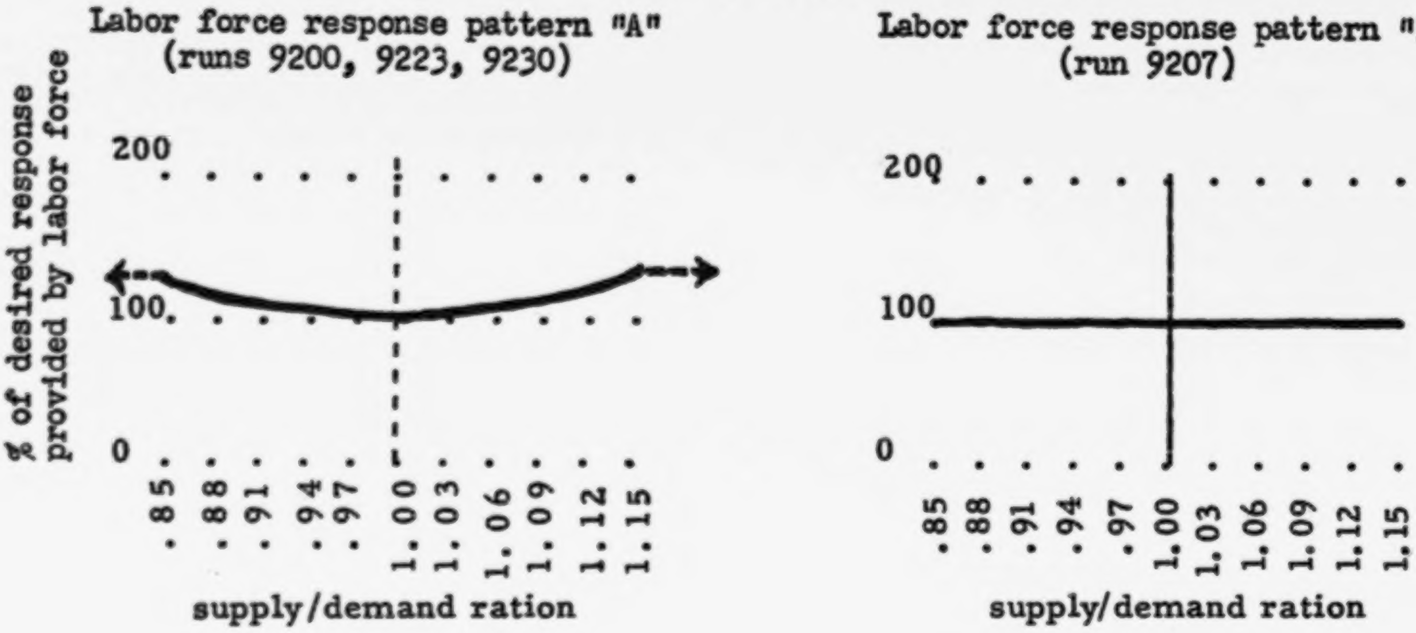
TABLE 1. CONTROL CONSTANT VALUES, 9200 SERIES

RUN	KGPOP	SEN. TBL.	KOSW( )	KOSJ( )	DRJE( )	KDCPY	KMNCP	KMXCP	KCPE1	KCPE5	KCPEH	KCPEC	KCDER	KMNP1	KMNP2	KMNPH	KMNPC
9200	0.0237	C	1.0	1.0	0.5	3	0	0.1	0	0	0	0	[1]0.00002	0.37	0.50	0.59	0.66
9207	(1)	B	(1)	(1)													
9223				6										.30	.43	.52	.52
9230				2			.035			.0004	.0015	.003					

RUN	KMXIO	KMNIO	KMDCO	DMFCE	DMFHS	DMFE2	UMFHS	UMFE2	UMFE1	W( )MD	KMXP1	KMXP2	KMXPH	KMXPC
9200	1.0	0	1.0	0	0	0	0	0	0	0	0.43	0.56	0.65	0.72
9207														
9223											.50	.63	.72	.80
9230	.05	.15												

[1] Only changes to values of variables used in run 9200 are shown in successive listings.

Table 2. Response Pattern of General Population and Labor Force


Labor force response pattern "A" (runs 9200, 9223, 9230)

Labor force response pattern "B" (run 9207)

Run 9200

In this run, control constant values are set as shown in table 1. These settings approximate conditions in which the population is growing as currently projected. Educational attainment is stabilized at the present (1960) levels of retention, i.e., approximately 98 percent of the population continuing to the second 4 years of elementary education, 91 percent continuing into high school, and 33 percent going on to some higher education after high school. The labor force is constrained to participation rates which can vary no more than 3 percent plus or minus from the current (1960) participation rates. The death rate is slowly decreasing to add to population growth.

In this run, it will be possible to restructure no more than 50 percent of the desired amount in any time period. Productivity cannot decrease, but it cannot increase more than 10 percent per time period (more than double the current rate of increase). Changes in the level of output are not constrained, and may double in one time period if the need exists in the model.

The response pattern of the general population and the labor force to supply and demand information is as shown in table 2, i.e., the labor force is overresponsive to information, but in a such balanced way that they move into and out of the labor force with equal overresponse.

The principal effects that may be observed here are localized imbalances due to delays in restructuring. The system expands stably, with productivity showing slight increases due to short-term localized shortages; output is expanding at a rate varying from 2 to 5 percent per time period. However, the "surpluses" and "shortages" discussed in the main body of the report appear, as typified by the graph showing supply and demand in the high school sector. It may be seen that supply leads demand smoothly, with demand about two time periods behind supply throughout the bulk of the simulation.

Run 9207

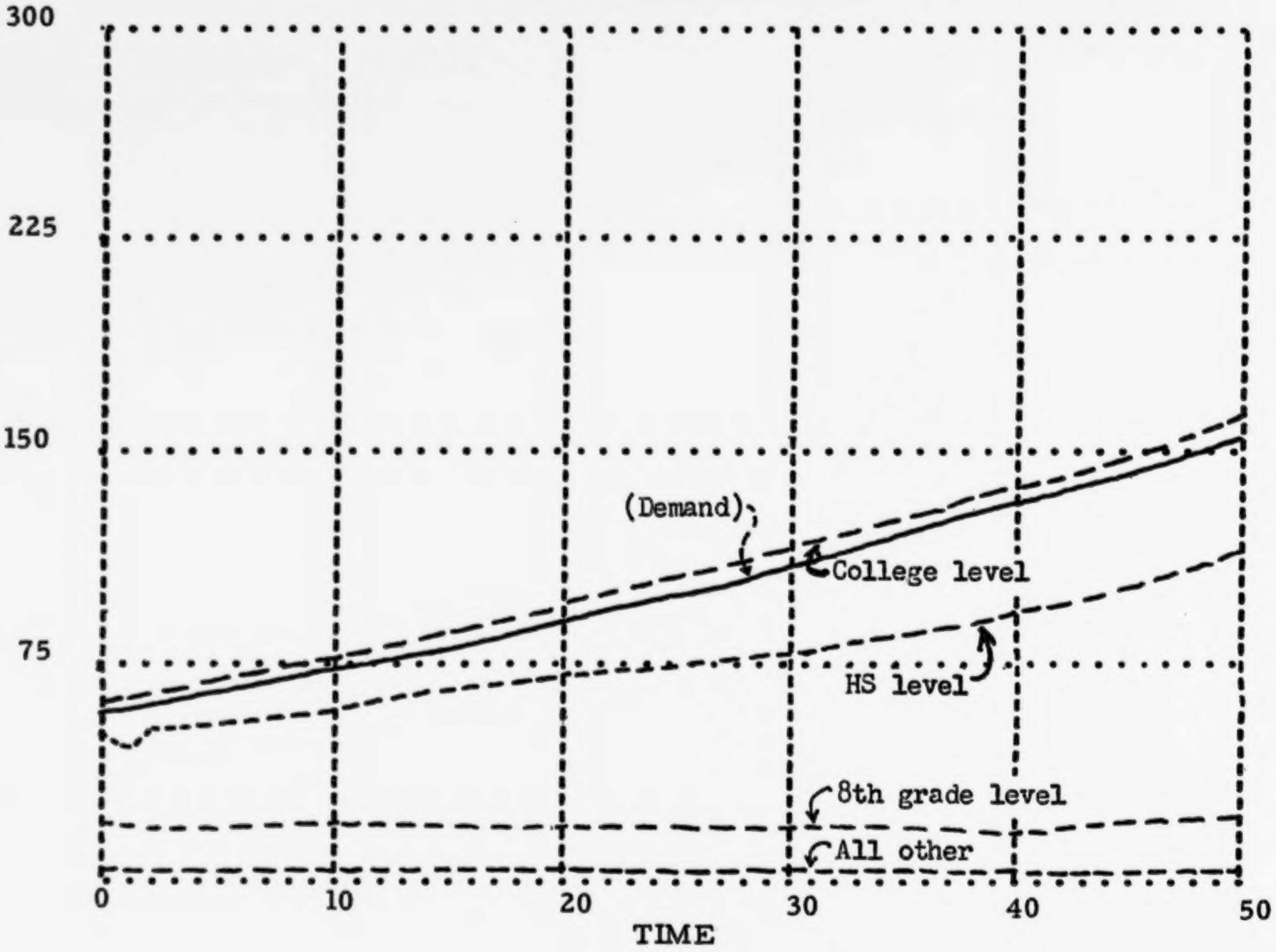
This run is identical in system conditions with run 9200, with the exception of the sensitivity response curve. This curve has now been changed to one illustrated in table 2, which represents a shift from overresponse to supply and demand information to a "perfect" response, i.e., one in which the labor force is changed in number by the exact amount presumably required to balance the supply/demand situation. However, the participation rates quickly run into the constraining percentages, and no further changes can take place except with population growth. Thus in the graph of the high school supply/demand balance, it is seen that the labor force varies directly with the population because of these constraints.

The result is that runs 9200 and 9207 are identical in behavior and quantitative results.

Run 9223

In this run, we return to the original sensitivity curve and add a degree of imbalance in the curve by increasing the overresponse to job opportunity only. In addition, we expand the constraints on labor force participation to 10 percent around the basic participation rate with which the run is started.

Graph 9200-A: Supply of Labor by Attainment Level, Plotted Cumulatively



These changes allow us to observe two effects. First, we can see that the expansions on the constraints on participation rates allows the sensitivity curve to become more dominant in the model, with the participations beginning to change rapidly and overresponsively to expansions of demand. This represents a change in the priority of factors governing participation decisions, such as the removal of economic constraints which force a person to work with little or no option. The persons in the model are now capable of making decisions to work more on the basis of short-term opportunity or lack of it.

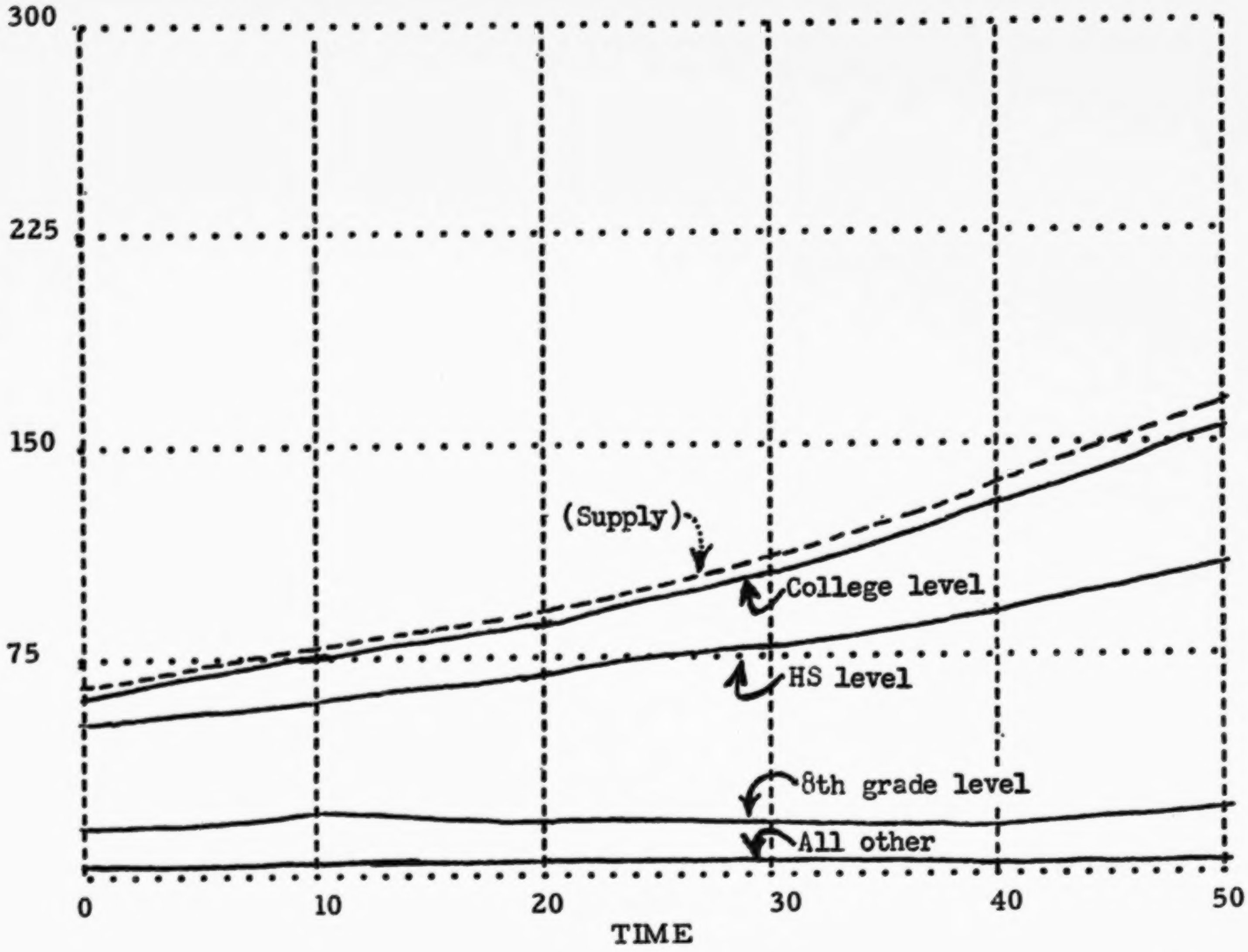
The second effect which now becomes apparent in bold type is the pipeline delay of productivity changes and its effect when not taken into account in further decisions for productivity change. These factors are causing excessive uses of productivity to offset short-term labor shortages (themselves caused by the response pattern of the labor force). This precipitates downturns or levelings of demand for labor and the consequent results discussed in the main body of the report.

Run 9230

This particular run sets the system variables to represent certain constraints on changes in productivity and output representing current goals, as well as continued upgrading of educational attainment. Productivity is set at a minimum growth rate of 3.5 percent per year, representing expansion of productivity occurring as a function of incentives other than labor shortages. The economy expands at a minimum rate of 5 percent per time period. The rate of educational attainment is upgraded in a straight-line manner, so that at the end of the 50 time periods nearly everyone is continuing through high school, and college attendance is double its present level.

The resulting differences, compared to runs 9200 and 9207, are of degree only; the essential systems behavior is the same. The lag of restructuring be-

Graph 9200-B: Demand for Labor by Attainment Level, Plotted Cumulatively



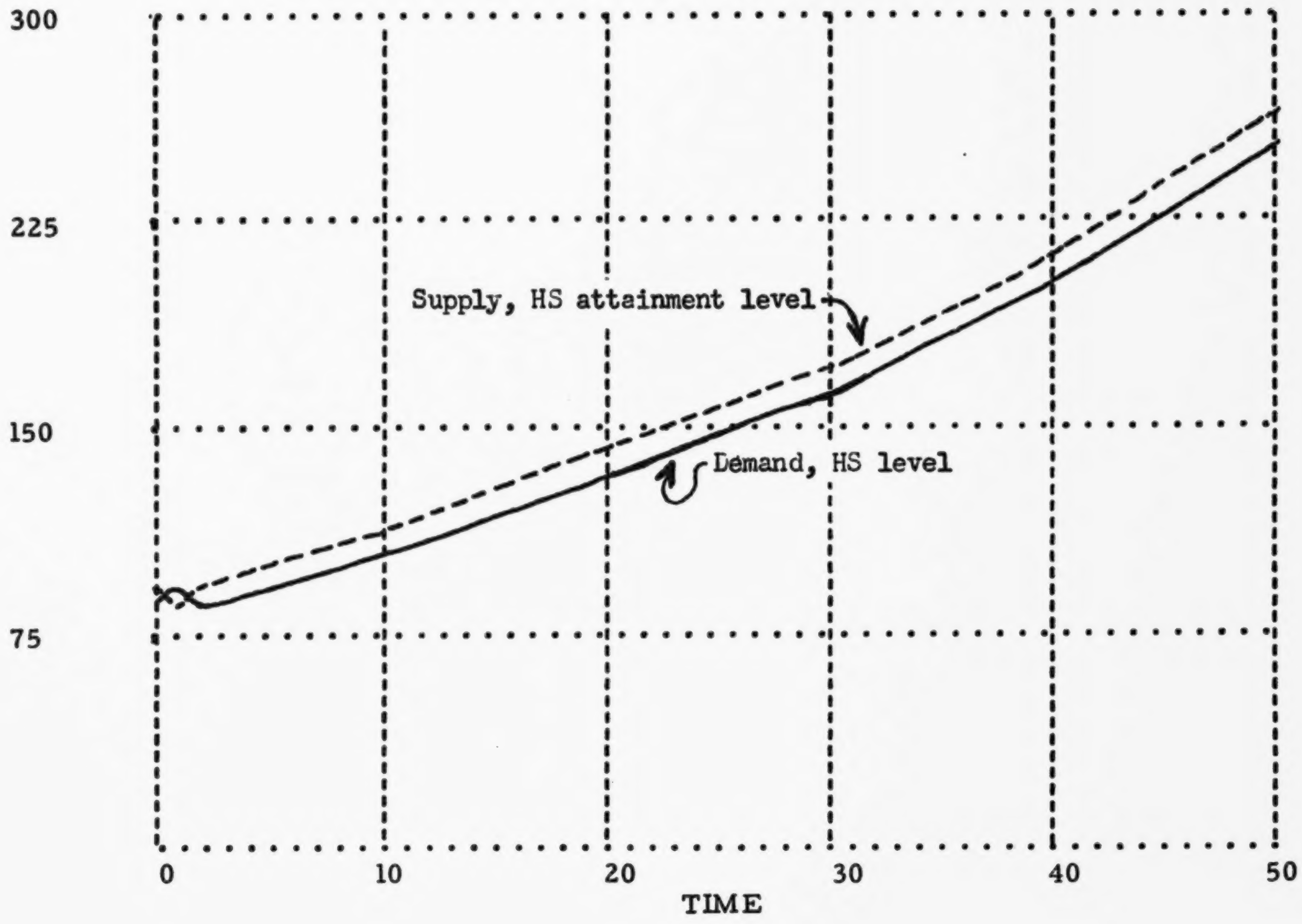
hind supply of labor is increased, largely as a function of the higher growth rates now being induced in the upper attainment levels by virtue of increasing retention rates.

Thus, in this simulation the goal of increased educational attainment is acting somewhat in conflict with the goal of balanced supply and demand. While both goals are individually valuable and not to be questioned, how well they can be attained in the same system becomes a question of their interaction with particular systems constraints and methods of operation and adjustment. This system is acting, in matters of policy, as if changing the goals or changing certain aspects of behavior will, in fact, override the built-in structural problems in system forecasting, response times, and so forth. The solution to this particular problem, as represented, is not simply a question of degree or volume in the system nor just a question of system behavior and structure; but it is, in fact, a solution requiring consideration of both the volume of flow and the structure which is handling that volume.

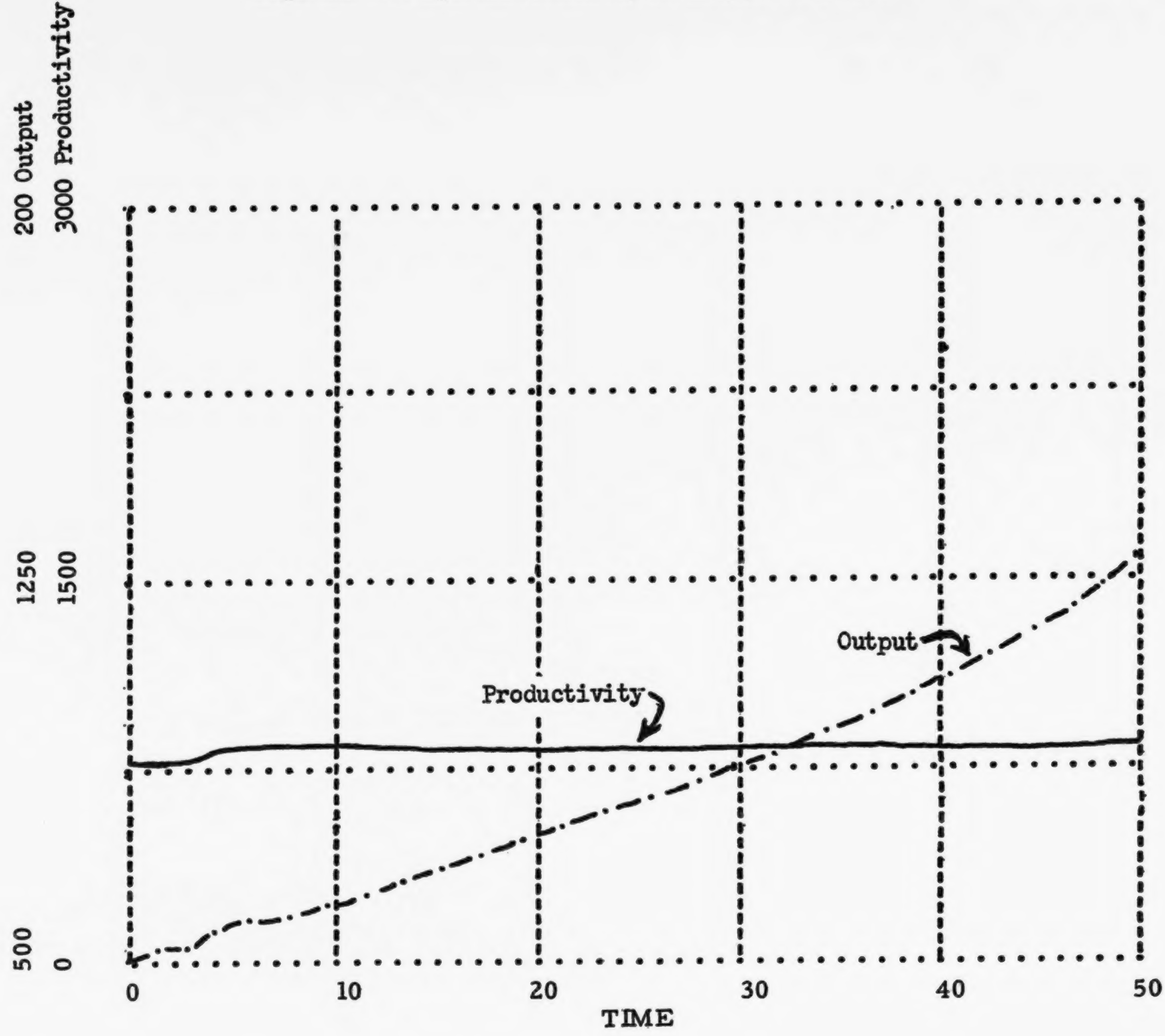
The Future of the Model

At the time of writing of this interim report, funds remain to continue expansion and testing of the model. Some modifications of large degree are anticipated, and a second report will be written, probably not later than April 15, 1966, discussing the results of this continued and expanded activity.

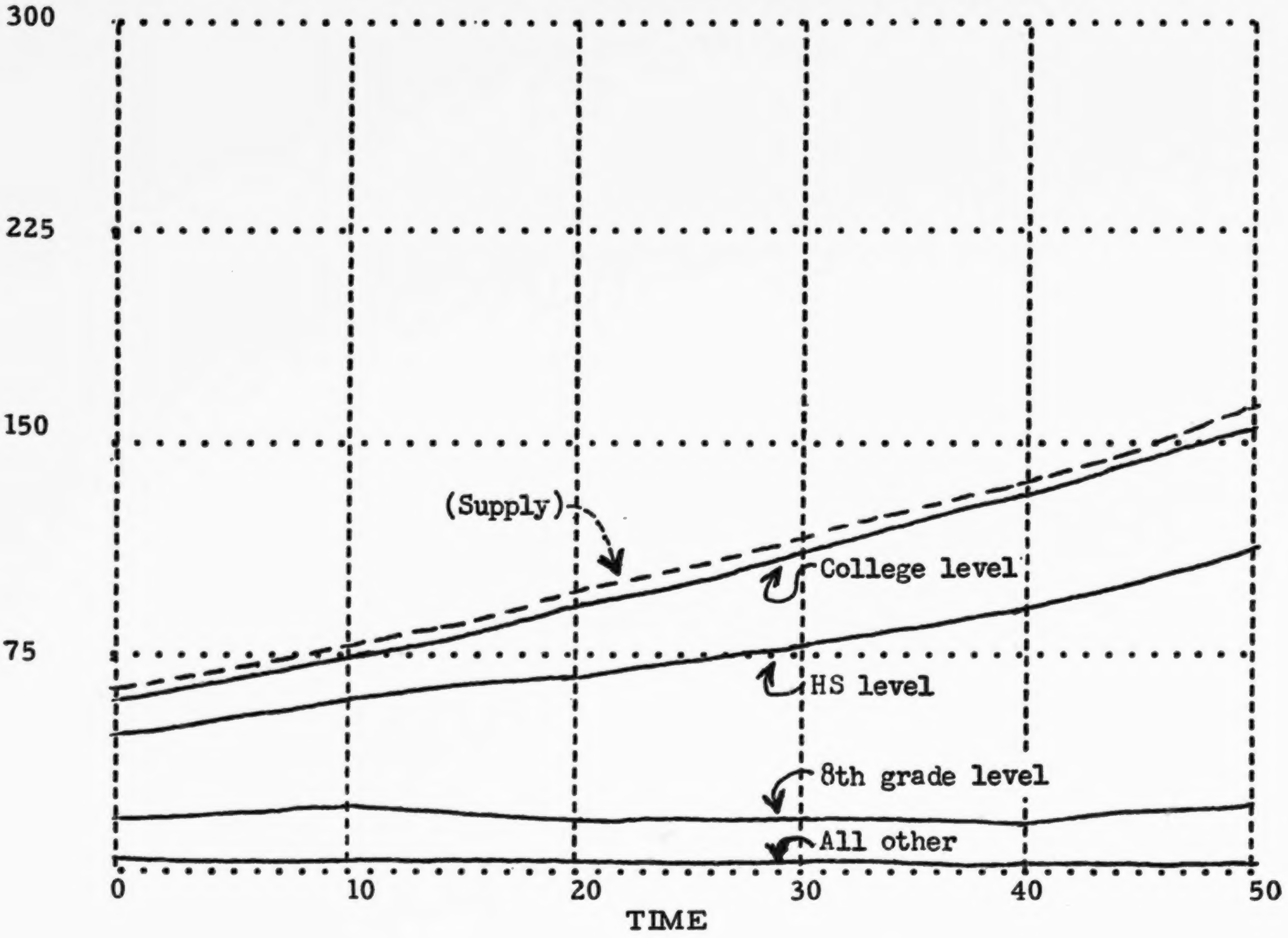
Graph 9200-C: Supply and Demand, High School Attainment Level



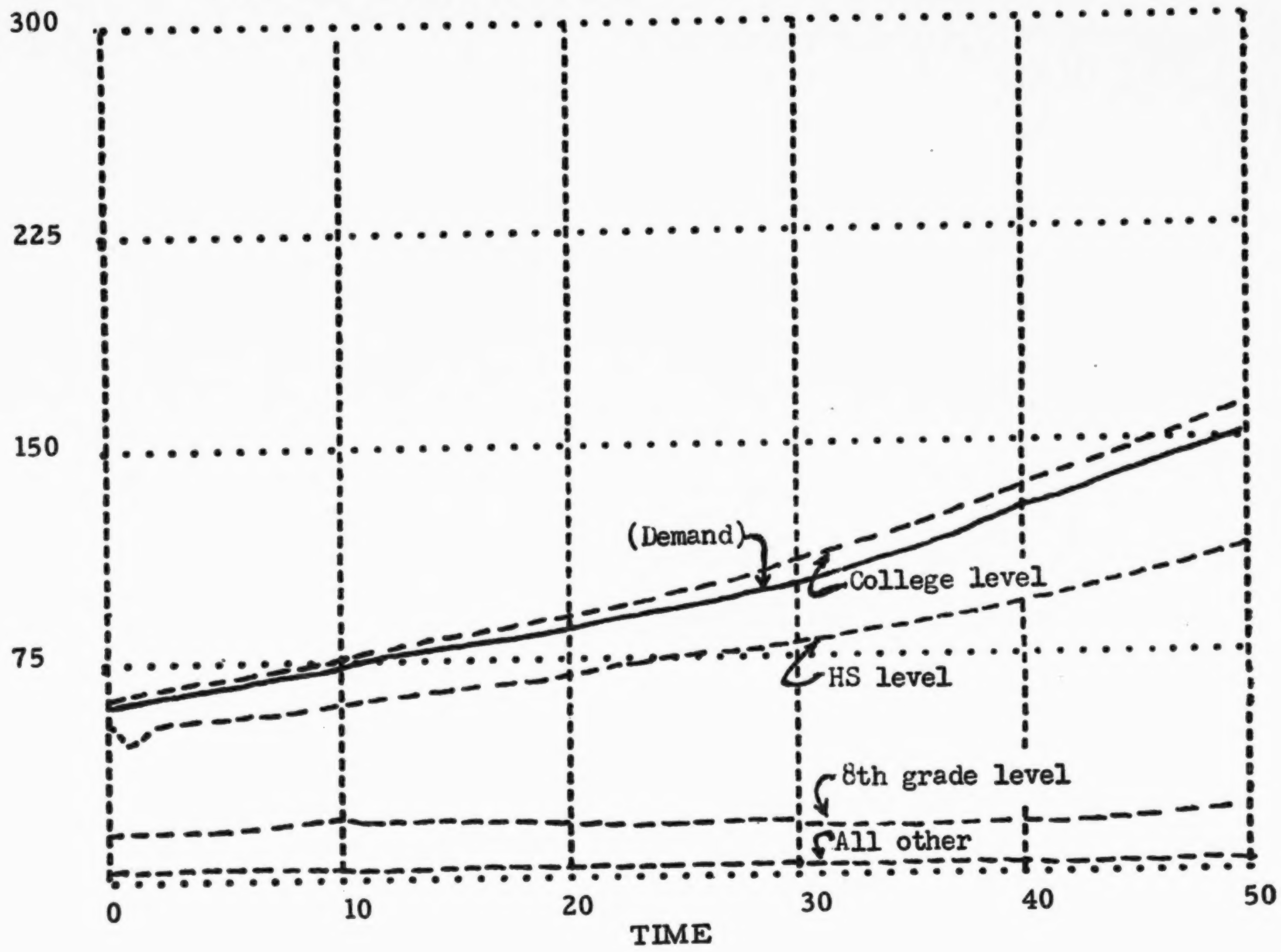
Graph 9200-D: Output and Productivity Levels Required by System



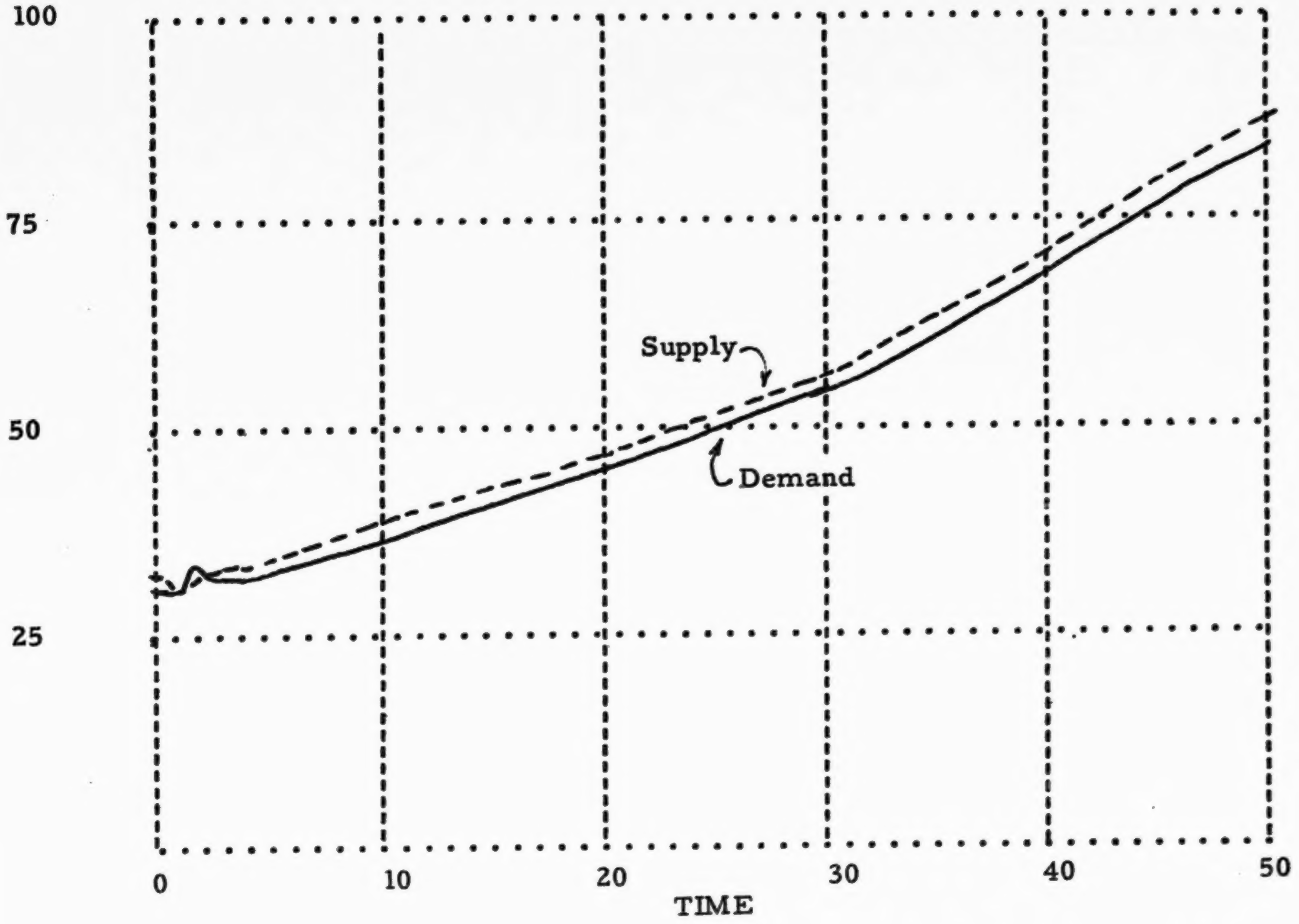
Graph 9207–A: Demand for Labor by Attainment Level, Plotted Cumulatively



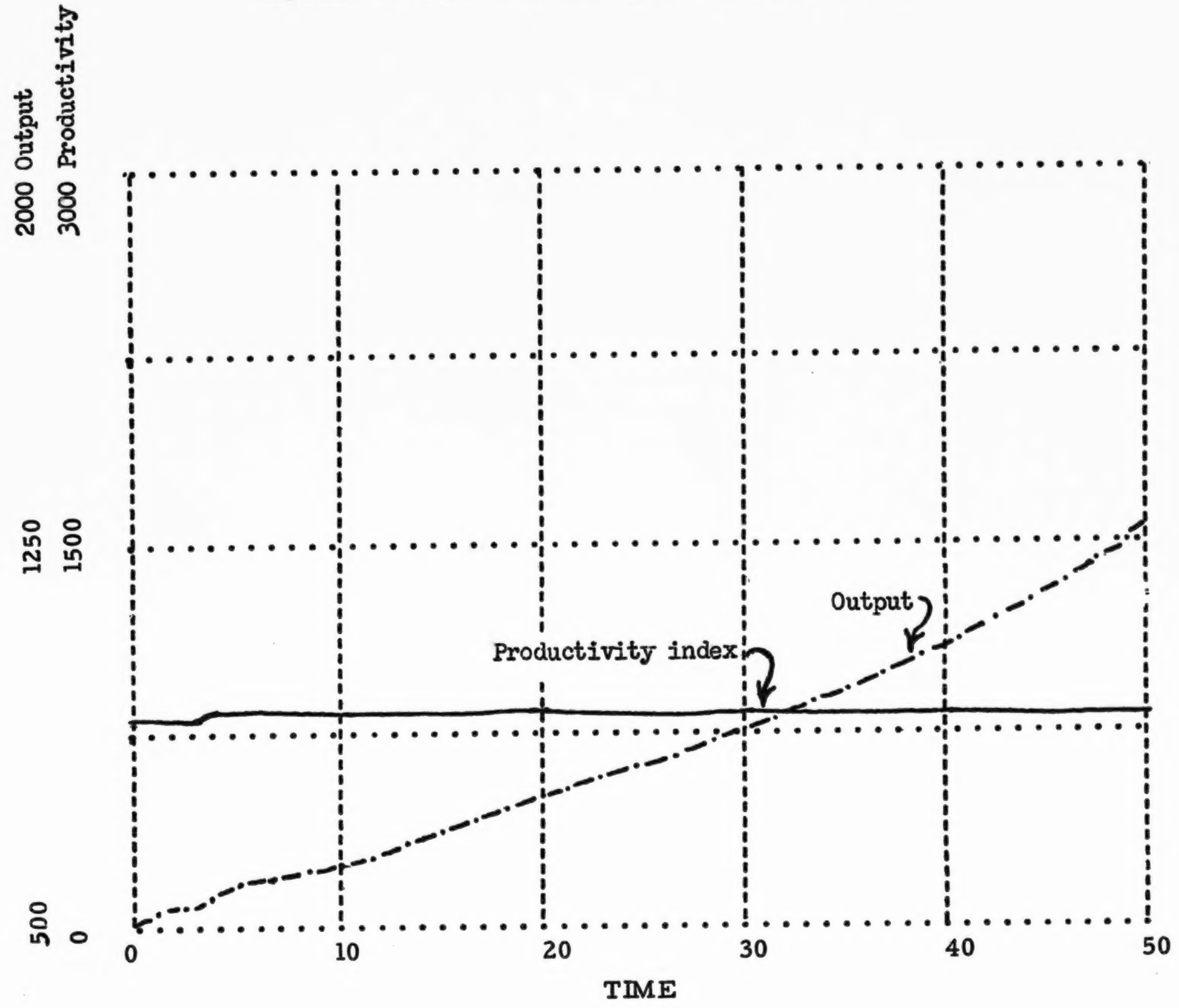
Graph 9207–B: Supply of Labor by Attainment Level, Plotted Cumulatively



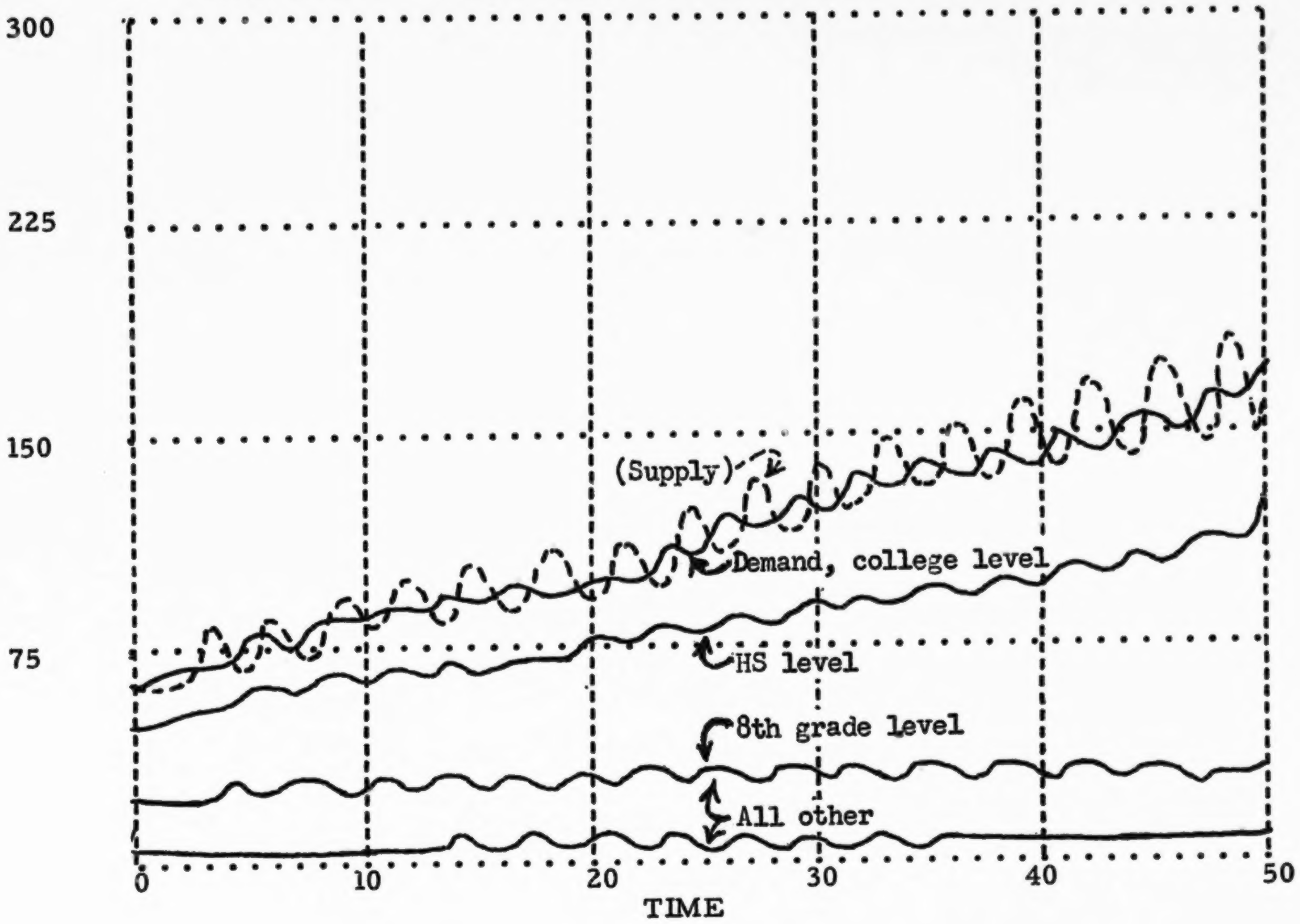
Graph 9207–C: Supply and Demand at High School Attainment Level



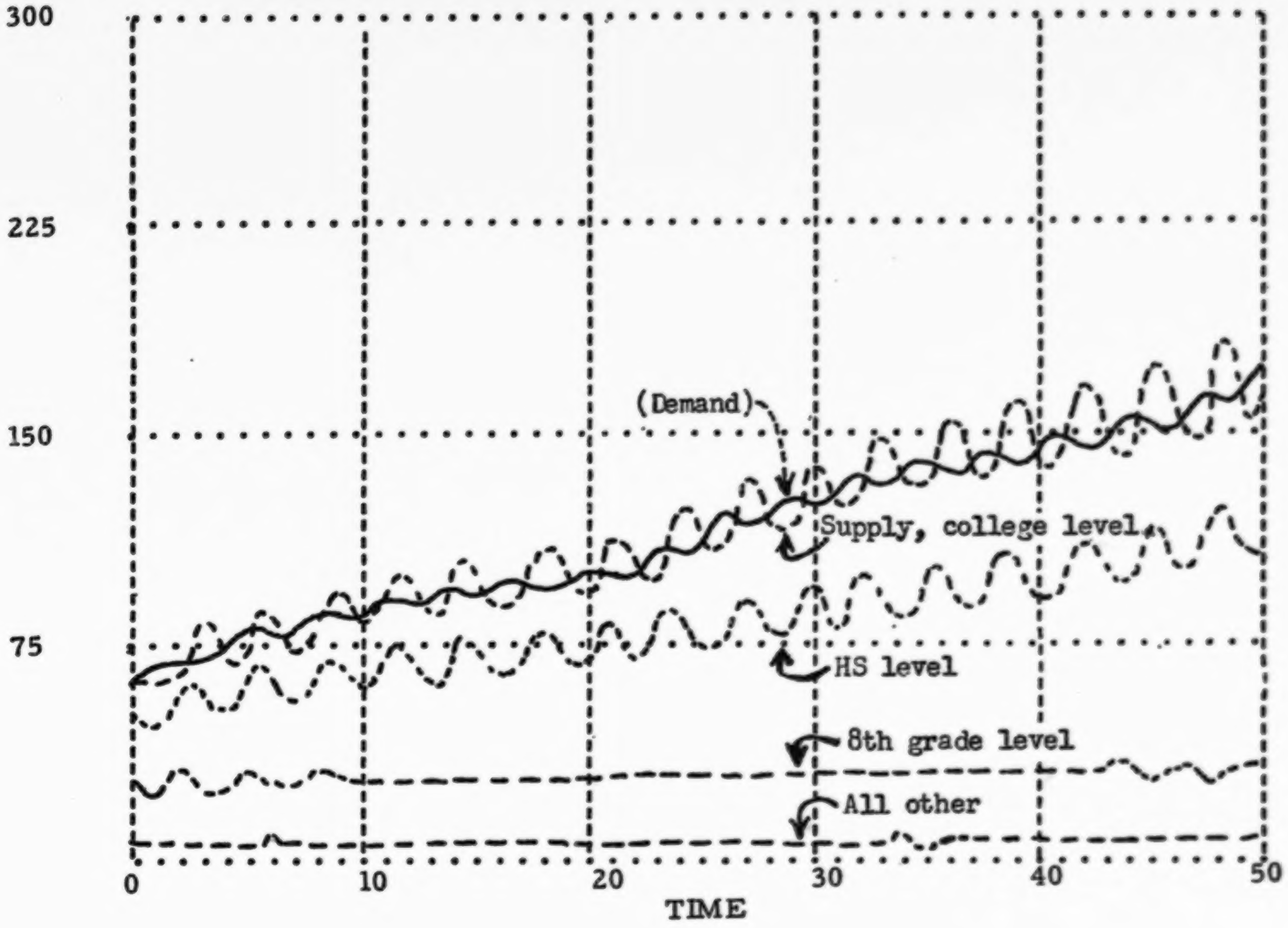
Graph 9207-D: Output and Productivity Levels Required by System



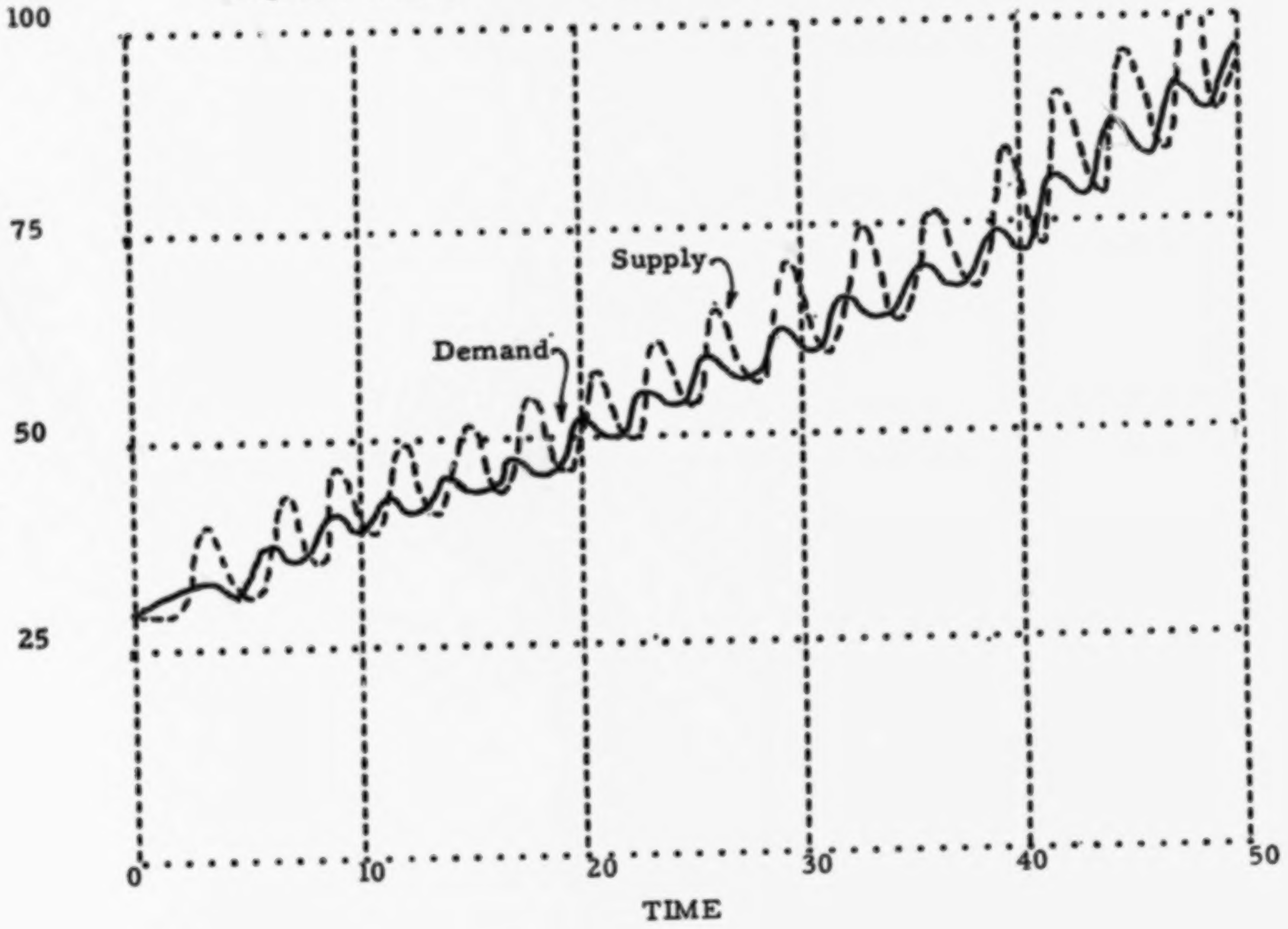
Graph 9223–A: Demand for Labor by Level of Attainment, Plotted Cumulatively



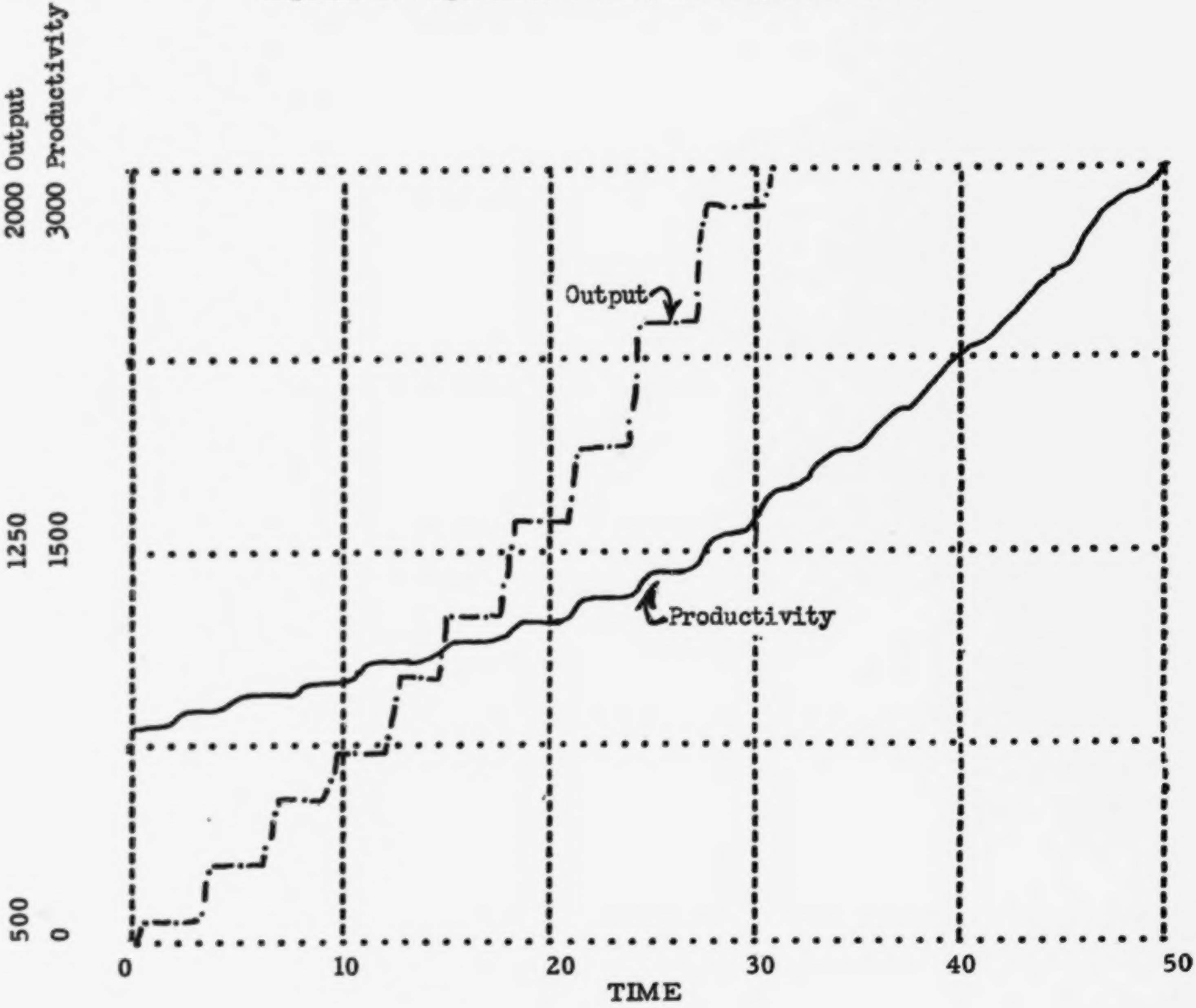
Graph 9223-B: Supply of Labor by Level of Attainment, Plotted Cumulatively



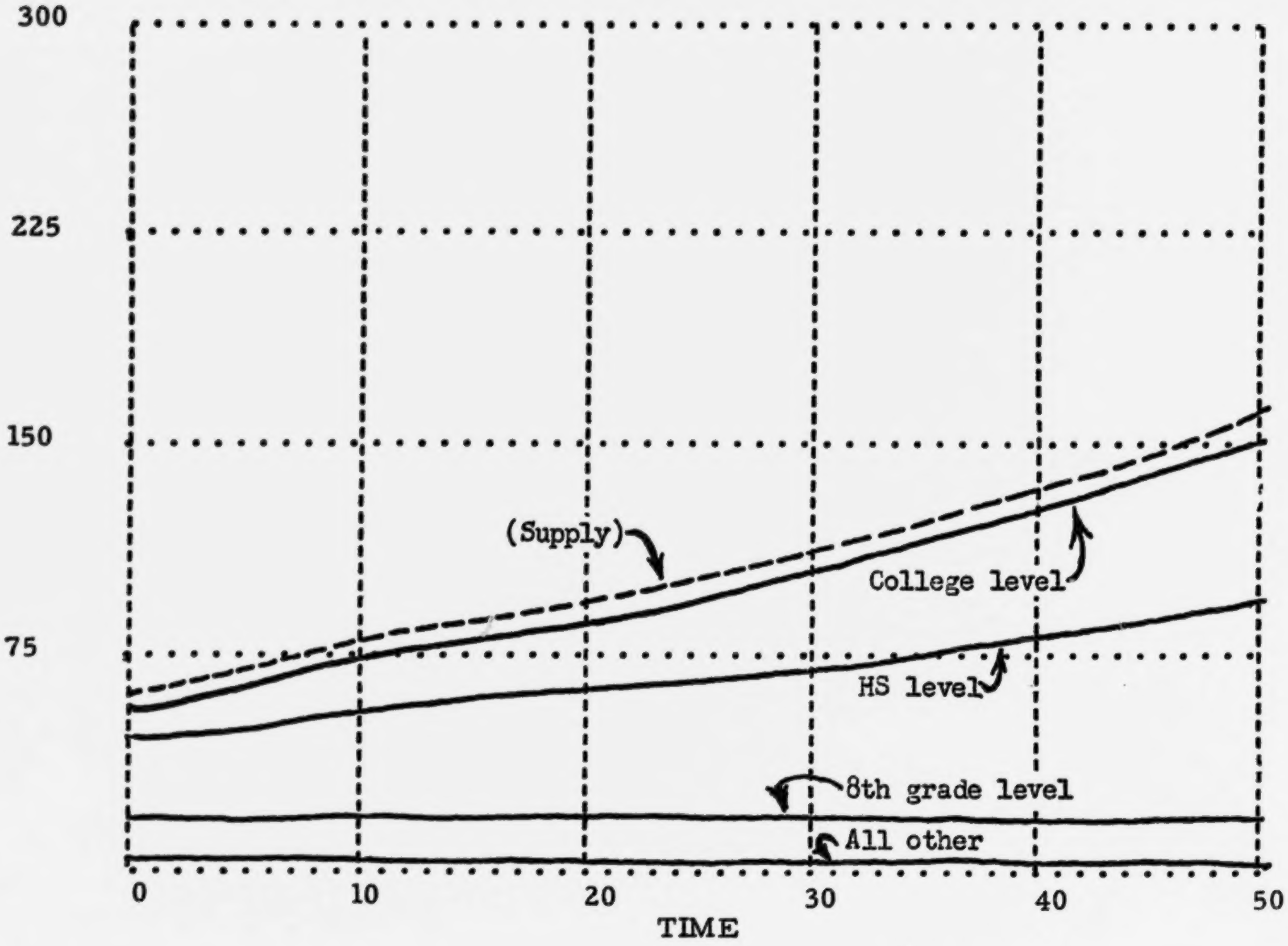
Graph 9223-C: Supply and Demand of Labor, High School Attainment Level



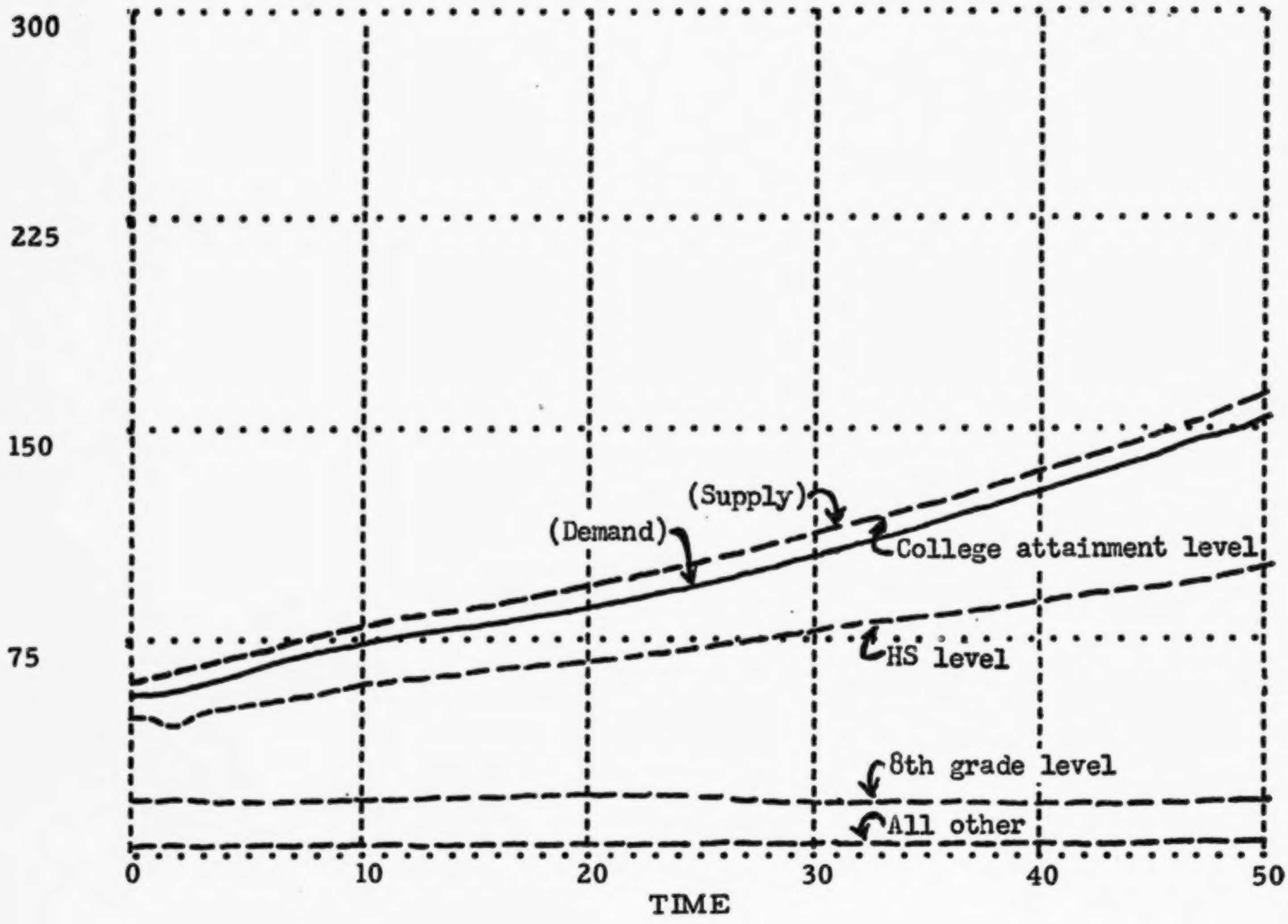
Graph 9223-D: Output and Productivity Levels Required by System



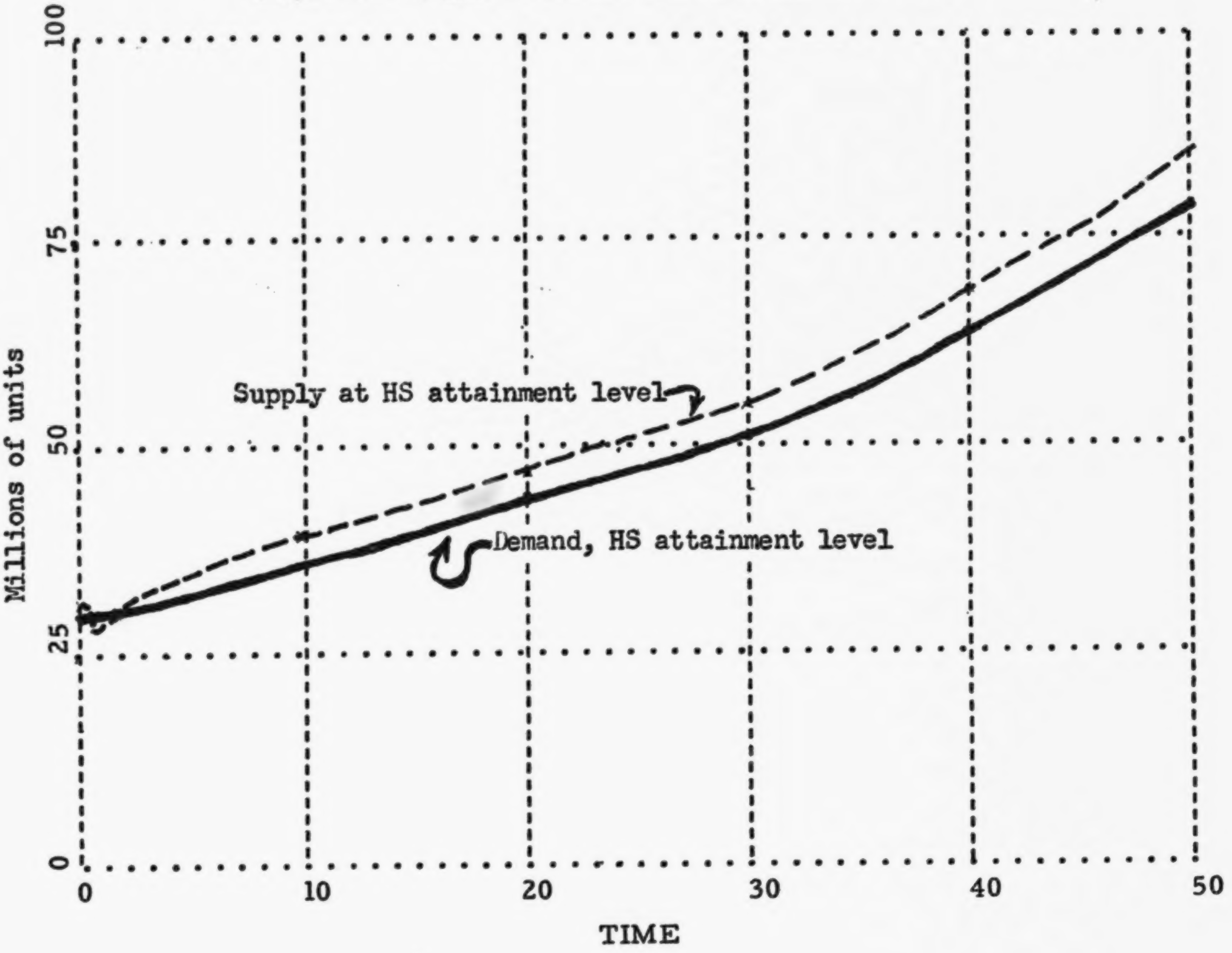
Graph 9230-A: Demand for Labor by Level of Attainment, Plotted Cumulatively



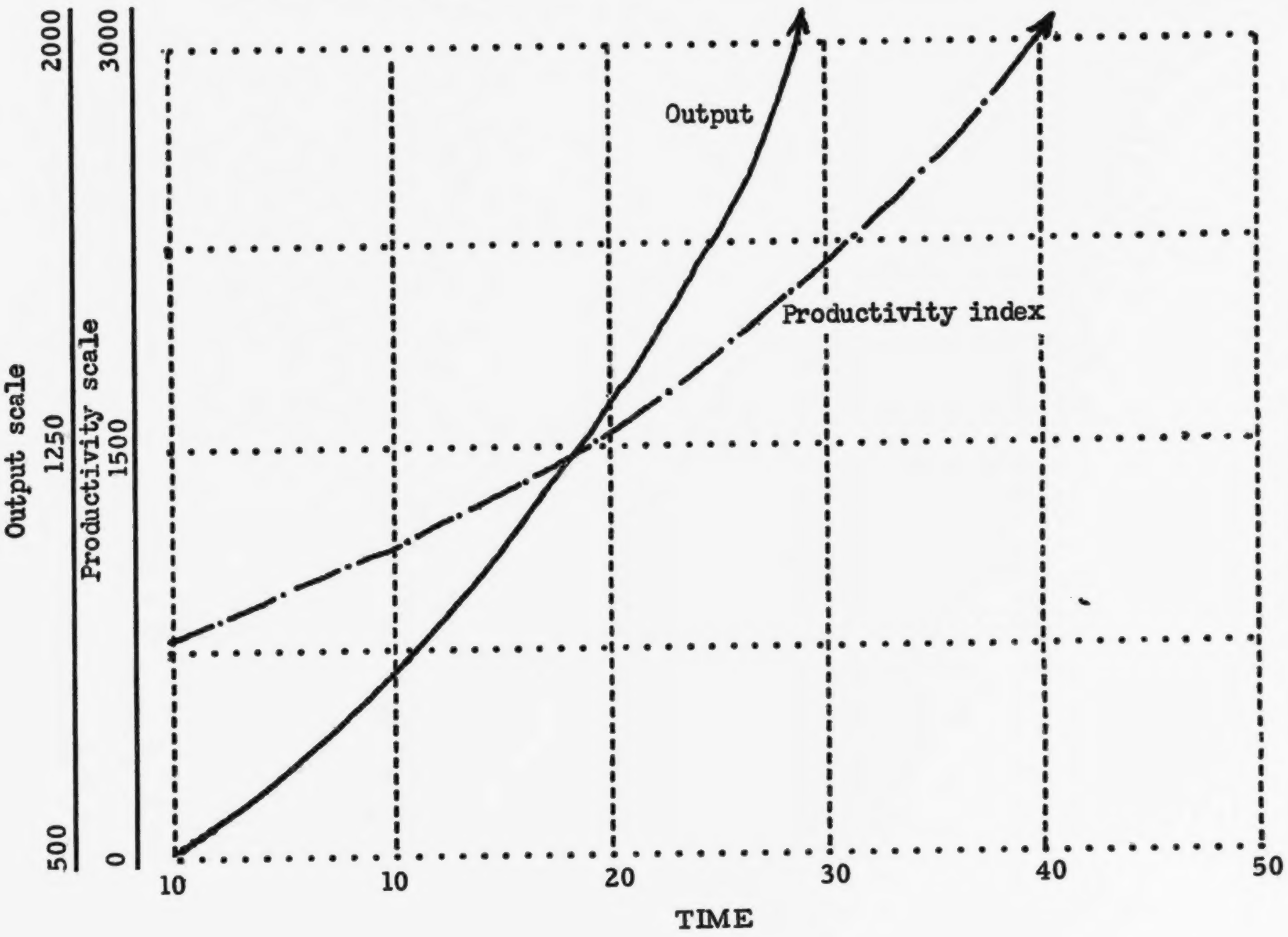
Graph 9230-B: Supply of Labor by Attainment Levels, Plotted Cumulatively



Graph 9230-C: Supply and Demand, High School Attainment Level



Graph 9230–D: Productivity Index and Output Level Required by System



Dynamo Program Listing for Model

```
*          MAS—9200,DYN,TEST,1,1,0,0     MANPOWER ADJUSTMENT SYSTEM

1L         POPUL.K=POPUL.J+(DT)(GRPOP.JK−DRPOP.JK)
44R        DRPOP.KL=(POPUL.K)(DEATH.K)/DT
44R        GRPOP.KL=(POPUL.K)(KGPOP)/DT
C          KGPOP=.0237
12A        DEME1.K=(NPDL1.K)(DEMLB.K)
12A        DEME2.K=(NPDL2.K)(DEMLB.K)
12A        DEMHS.K=(NPDLH.K)(DEMLB.K)
12A        DEMCE.K=(NPDLC.K)(DEMLB.K)
14A        NPDL1.K=BXCP1*2.K+(DRJE1)(DCPD1.K)
C          DRJE1=.5
14A        NPDL2.K=BXCP2*2.K+(DRJE2)(DCPD2.K)
C          DRJE2=.5
14A        NPDLH.K=BXCPH*2.K+(DRJHS)(DCPDH.K)
C          DRJHS=.5
14A        NPDLC.K=PXCPC*2.K+(DRJCE)(DCPDC.K)
C          DRJCE=.5
37B        BXCP1=BOXLIN(2,1)
37B        BXCP2=BOXLIN(2,1)
37B        BXCPH=BOXLIN(2,1)
37B        BXCPC=BOXLIN(2,1)
C          BXCP1*=.0490/.0490
C          BXCP2*=.2786/.2786
C          BXCPH*=.4748/.4748
C          BXCPC*=.1976/.1976
6A         BXCP1*1.K=NPDL1.K
6A         BXCP2*1.K=NPDL2.K
6A         BXCPH*1.K=NPDLH.K
6A         BXCPC*1.K=NPDLC.K
7A         DCPD1.K=DDLS1.K−BXCP1*2.K
7A         DCPD2.K=DDLS2.K−BXCP2*2.K
7A         DCPDH.K=DDLSH.K−BXCPH*2.K
7A         DCPDC.K=DDLSC.K−BXCPC*2.K
24A        DDLS1.K=(1/4)(BXSL1*2.K+BXSL1*3.K+BXSL1*4.K+BXSL1*5.K+0+0)
24A        DDLS2.K=(1/4)(BXSL2*2.K+BXSL2*3.K+BXSL2*4.K+BXSL2*5.K+0+0)
24A        DDLSH.K=(1/4)(BXSLH*2.K+BXSLH*3.K+BXSLH*4.K+BXSLH*5.K+0+0)
24A        DDLSC.K=(1/4)(BXSLC*2.K+BXSLC*3.K+BXSLC*4.K+BXSLC*5.K+0+0)
37B        BXSL1=BOXLIN(5,1)
37B        BXSL2=BOXLIN(5,1)
37B        BXSLH=BOXLIN(5,1)
37B        BXSLC=BOXLIN(5,1)
6A         BXSL1*1.K=CPSL1.K
6A         BXSL2*1.K=CPSL2.K
6A         BXSLH*1.K=CPSLH.K
6A         BXSLC*1.K=CPSLC.K
36N        BXSL1=BOXLOAD(1,.0490)
36N        BXSL2=BOXLOAD(1,.2786)
36N        BXSLH=BOXLOAD(1,.4748)
36N        BXSLC=BOXLOAD(1,.1976)
20A        CPSL1.K=ELSE1.K/CTELS.K
20A        CPSL2.K=ELSE2.K/CTELS.K
20A        CPSLH.K=ELSHS.K/CTELS.K
20A        CPSLC.K=ELSCE.K/CTELS.K
9A         CTELS.K=ELSE1.K+ELSE2.K+ELSHS.K+ELSCE.K

           EDUCATION OF POPULATION

1L         STUE1.K=STUE1.J+(DT)(RENE1.JK−RLVE4.JK)
1L         STUE2.K=STUE2.J+(DT)(RENE5.JK−RLVE8.JK)
1L         STUHS.K=STUHS.J+(DT)(RENHS.JK−RLVHS.JK)
1L         STUCE.K=STUCE.J+(DT)(RENCL.JK−RLVCL.JK)
37B        BXPOP=BOXLIN(22,1)
36N        BXPOP=BOXLOAD(KGPOP,POPUL)
6A         BXPOP*1.K=GRPOP.K
44R        RENE1.KL=(BXPOP*6.K)(PCEN1.K)/DT
```

```
37B     BXE14=BOXLIN(5,1)
36N     BXE14=BOXLOAD(GRPOP,PCEN1)
6A      BXE14*1.K=RENE1.JK
6R      RLVE4.KL=BXE14*4.K
47A     PCEN1.K=RAMP(KCPE1,5)

C       KCPE1=0
6N      PCEN1=.999
44R     RENE5.KL=(BXPOP*10.K)(PCEN5.K)/DT
37B     BXE58=BOXLIN(5,1)
36N     BXE58=BOXLOAD(GRPOP,PCEN5)
6A      BXE58*1.K=RENE5.JK
6R      RLVE8.KL=BXE58*4.K
47A     PCEN5.K=RAMP(KCPE5,5)
C       KCPE5=0
6N      PCEN5=0.978
44R     RENHS.KL=(BXPOP*14.K)(PCEHS.K)/DT
37B     BXEHS=BOXLIN(5,1)
36N     BXEHS=BOXLOAD(GRPOP,PCEHS)
6A      BXEHS*1.K=RENHS.JK
6R      RLVHS.KL=BXEHS*4.K
47A     PCEHS.K=RAMP(KCPEH,5)
C       KCPEH=0
6N      PCEHS=0.916
44R     RENCL.KL=(BXPOP*18.K)(PCENC.K)/DT
37B     BXENC=BOXLIN(5,1)
36N     BXENC=BOXLOAD(GRPOP,PCENC)
6A      BXENC*1.K=RENCL.JK
6R      RLVCL.KL=BXENC*4.K
47A     PCENC.K=RAMP(KCPEC,5)
C       KCPEC=0
6N      PCENC=0.332

        LABOR FORCE PARTICIPATION RATE BASED ON LIMITED SUP-DEM
          FEEDBACK

1L      POPE1.K=POPE1.J+(DT)(PLSE1.JK-DEAE1.JK)
1L      POPE2.K=POPE2.+(DT)(PLSE2.JK-DEAE2.JK)
1L      POPHS.K=POPHS.J+(DT)(PLSHS.JK-DEAHS.JK)
1L      POPCE.K=POPCE.J+(DT)(PLSCE.JK-DEACE.JK)
47A     DEATH.K=RAMP(KCDER,5)
6N      DEATH=.0106
C       KCDER=-.0002
20A     PCPE1.K=POPE1.K/P12HC.K
20A     PCPE2.K=POPE2.K/P12HC.K
20A     PCPHS.K=POPHS.K/P12HC.K
9A      PCPCE.K=1.0-PCPE1.K-PCPE2.K-PCPHS.K
9A      P12HC.K=POPE1.K+POPE2.K+POPHS.K+POPCE.K
46R     DEAE1.KL=(POPUL.K)(DEATH.K)(PCPE1.K)/((DT)(1)(1))
46R     DEAE2.KL=(POPUL.K)(DEATH.K)(PCPE2.K)/((DT)(1)(1))
46R     DEAHS.KL=(POPUL.K)(DEATH.K)(PCPHS.K)/((DT)(1)(1))
46R     DEACE.KL=(POPUL.K)(DEATH.K)(PCPCE.K)/((DT)(1)(1))
7R      PLSE1.KL=RLVE4.JK-RENE5.JK
7R      PLSE2.KL=RLVE8.JK-PENHS.JK
7R      PLSHS.KL=RLVHS.JK-RENCL.JK
6R      PLSCE.KL=RLVCL.JK
1L      LFPE1.K=LFPE1.J+(DT)(CPSD1.JK+0)
1L      LFPE2.K=LFPE2.J+(DT)(CPSD2.JK+0)
1L      LFPHS.K=LFPHS.J+(DT)(CPSDH.JK+0)
1L      LFPCE.K=LFPCE.J+(DT)(CPSDC.JK+0)
6N      LFPE1=3.788
6N      LFPE2=18.999
6N      LFPHS=31.062
6N      LFPCE=12.931
20R     CPSD1.KL=MNPR1.K/DT
20R     CPSD2.KL=MNPR2.K/DT
20R     CPSDH.KL=MNPRH.K/DT
20R     CPSDC.KL=MNPRC.K/DT
56A     MNPR1.K=MAX(MINP1.K,MXPR1.K)
56A     MNPR2.K=MAX(MINP2.K,MXPR2.K)
56A     MNPRH.K=MAX(MINPH.K,MXPRH.K)
56A     MNPRC.K=MAX(MINPC.K,MXPRC.K)
54A     MXPR1.K=MIN(MAXP1.K,DCLF1.K)
54A     MXPR2.K=MIN(MAXP2.K,DCLF2.K)
```

```
54A       MXPRH.K=MIN(MAXPH.K,DCLFH.K)
54A       MXPRC.K=MIN(MAXPC.KDCLFC.K)
14A       MAXP1.K=−LFPE1.K+(POPE1.K)(KMXP1)
14A       MAXP2.K=−LFPE2.K+(POPE2.K)(KMXP2)
14A       MAXPH.K=−LFPHS.K+(POPHS.K)(KMXPH)
14A       MAXPC.K=−LFPCE.K+(POPCE.K)(KMXPC)
13A       DCLF1.K=(NSEN1.K)(SURE1.K)(SDSR1.K)
13A       DCLF2.K=(NSEN2.K)(SURE2.K)(SDSR2.K)
13A       DCLFH.K=(NSENH.K)(SURHS.K)(SDSRH.K)
13A       DCLFC.K=(NSENC.K)(SURCE.K)(SDSRC.K)
14A       MINP1.K=−LFPE1.K+(POPE1.K)(KMNP1)
14A       MINP2.K=−LFPE2.K+(POPE2.K)(KMNP2)
14A       MINPH.K=−LFPHS.K+(POPHS.K)(KMNPH)
14A       MINPC.K=−LFPCE.K+(POPCE.K)(KMNPC)
C         KMXP1=.43
C         KMXP2=.56
C         KMXPH=.65
C         KMXPC=.72
C         KMNP1=.37
C         KMNP2=.50
C         KMNPH=.59
C         KMNPC=. 66
6N        OUPUT=502.6
1L        OUPUT.K=CUPUT.J+(DT)(RCOUT.JK+0)
12A       DSGNP.K=(TLABF.K)(NXPDY.K)
18A       DROUT.K=(KMDCO)(DSGNP.K−OUPUT.K)
C         KMDCO=1.0
20A       PCRCO.K=DROUT.K/OUPUT.K
56A       MNRCO.K=MAX(PCRCO.K,KMNIO)
C         KMNIO=0
54A       MXRCO.K=MIN(MNRCO.K,KMXIO)
44R       RCOUT.KL=(MXRCO.K)(OUPUT.K)/DT
C         KMXIO=1.0
1L        LEVIN.K=LEVIN.J+(DT)(ANINC.JK+0)
6N        LEVIN=0
20R       ANINC.KL=INCOM.K/DT
1L        TOGNP.K=TOGNP.J+(DT)(ANGNP.JK+0)
6N        TOGNP=0
20R       ANGNP.KL=OUPUT.K/DT
1L        NXPDY.K=NXPDY.J+(DT)(RCPDY.JK+0)
20R       RCPDY.KL=CCPDY.K/DT
16A       CCPDY.K=(KCPY1)(SIPDY.K)+(KCPY2)(BXSCP*2.K)+(KCPY3)(BXCSP*3.K)
X1        +(KCPY4)(BXSCP*4.K)
C         KCPY1=.20/KCPY2=.60/KCPY3=.20/KCPY4=0
37B       BXSCP=BOXLIN(6,1)
36N       BXSCP=BOXLOAD(NXPDY,KMNCP)
6A        BXSCP*1.K=SIPDY.K
56A       SIPDY.K=MAX(MINCP.K,DESCP.K)
12A       MINCP.K=(NXPDY.K)(KMNCP)
C         KMNCP=0
54A       DESCP.K=MIN(MAXCP.K,RQCPY.K)
12A       MAXCP.K=(NXPDY.K)(KMXCP)
C         KMXCP=.10
7A        RQCPY.K=DESPY.K−NXPDY.K
44A       DESPY.K=(DEMLB.K)(NXPDY.K)/TLABF.K
9A        TLABF.K=LFPE1.K+LFPE2.K+LFPHS.K+LFPCE.K
1L        DEMLB.K=DEMLB.J+(DT)(RCDLB.JK+0)
27R       RCDLB.KL=(OUPUT.K/NXPDY.K)−DEMLB.K
6N        DEMLB=64.10
6N        NXPDY=7.8901
20A       ACPR1.K=LFPE1.K/POPE1.K
20A       ACPR2.K=LFPE2.K/POPE2.K
20A       ACPRH.K=LFPHS.K/POPHS.K
20A       ACPRC.K=LFPCE.K/POPCE.K
58A       NSEN1.K=TABHL(TSDS1,BXSD1*1.K,.85,1.15,.03)
58A       NSEN2.K=TABHL(TSDS2,BXSD2*1.K,.85,1.15,.03)
58A       NSENH.K=TABHL(TSDSH,BXSDH*1.K,.85,1.15,.03)
58A       NSENC.K=TABHL(TSDSC,BXSDC*1.K,.85,1.15,.03)

C         TSDS1*=1/1.1/1.08/1/.95/.92/.95/1/1.08/1.1/1
C         TSDS2*=1/1.1/1.08/1/.95/.92/.95/1/1.08/1.1/1
C         TSDSH*=1/1.1/1.08/1/.95/.92/.95/1/1.08/1.1/1
C         TSDSC*=1/1.1/1.08/1/.95/.92/.95/1/1.08/1.1/1
```

```
51A     SDSR1.K=CLIP(KOSWI,KOSJ1,BXSD1*1.K,1)
51A     SDSR2.K=CLIP(KOSW2,KOSJ2,BXSD2*1.K,1)
51A     SDSRH.K=CLIP(KOSWH,KOSJH,BXSDH*1.K,1)
51A     SDSRC.K=CLIP(KOSW2,KOSJC,BXSDC*1.K,1)
20A     BXSD1*1.K=ELSE1.K/DEME1.K
20A     BXSD2*1.K=ELSE2.K/DEME2.K
20A     BXSDH*1.K=ELSHS.K/DEMHS.K
20A     BXSDC*1.K=ELSCE.K/DEMCE.K
37B     BXSD1=BOXLIN(2,1)
37B     BXSD2=BOXLIN(2,1)
37B     BXSDH=BOXLIN(2,1)
37B     BXSDC=BOXLIN(2,1)
C       BXSDC*=1/1
C       BXSDH*=1/1
C       BXSD2*=1/1
C       BXSD1*=1/1
C       KOSJ1=1.0
C       KOSJ2=1.0
C       KOSJH=1.0

C       KOSJC=1.0
C       KOSW1=1.0
C       KOSW2=1.0
C       KOSWH=1.0
C       KOSWC=1.0
```

INTERCLASS COMPETITION AND EFFECTIVE LABOR SUPPLY

```
15A     ELSCE.K=(LFPCE.K)(ZMCE.K)+(LFPHS.K)(UMFHS)
7A      SURCE.K=DEMCE.K-ELSCE.K
16A     ELSHS.K=(LFPHS.K)(ZMHS.K)+(LFPCE.K)(DMFCE)+(LFPE2.K)(UMFE2)+
X1      (SCEMD.K)(1)
7A      SURHS.K=DEMHS.K-ELSHS.K
16A     ELSE2.K=(LFPE2.K)(ZME2.K)+(LFPHS.K)(DMFHS)+(LFPE1.K)(UMFE1)+
X1      (SHSMD.K)(1)
7A      SURE2.K=DEME2.K-ELSE2.K
16A     ELSE1.K=(LFPE1.K)(ZME1.K)+(LFPE2.K)(DMFE2)+(SE2MD.K)(1)+(0)(0)
7A      SURE1.K=DEME1.K-ELSE1.K
7A      ZMCE.K=1.0-DMFCE
8A      ZMHS.K=1.0-UMFHS-DMFHS
8A      ZME2.K=1.0-UMFE2-DMFE2
7A      ZME1.K=1.0-UMFE1
C       DMFCE=0
C       UMFHS=0
C       DMFHS=0
C       UMFE2=0
C       DMFE2=0
C       UMFE1=0
56A     SCEMD.K=MAX(0,PCEMD.K)
56A     SHSMD.K=MAX(0,PHSMD.K)
56A     SE2MD.K=MAX(0,PE2MD.K)
12A     PCEMD.K=(SURCF.K)(WCEMD)
12A     PHSMD.K=(SURHS.K)(WHSMD)
12A     PE2MD.K=(SURE2.K)(WE2MD)
C       WCEMD=0
C       WHSMD=0
C       WE2MD=0
6N      POPUL=180
6N      STUE1=17.7
6N      STUE2=13.3
6N      STUHS=10.3
6N      STUCE=3.9
6N      POPE1=9.47
6N      POPE2=35.83
6N      POPHS=50.1
6N      POPCE=18.74
SPEC    DT=1/LENGTH=50/PRTPER=1/PLTPER=1
PRINT   1)BXPOP*1,BXPOP*6,BXPOP*10,BXPOP*14,BXPOP*18,INCOM,INCM1,INCM2,
X1      INCMH,INCMC/2)*,PCEN1,PCEN5,PCEHS,PCENC,*,MXIN1,MXIN2,MXINH,
X2      MXICL/3)*,RENE1,RENE5,RENHS,RENCL/4)*,STUE1,STUE2,STUHS,STUCE/5)*,
X3      PLSE1,PLSE2,PLSHS,PLSCE/6)POPUL,POPE1,POPE2,POPHS,POPCE,*,BXSD1*1,
X4      BXSD2*1,BXSDH*1,BXSDC*1/7)DRPOP,DEAE1,DEAE2,DEAHS,DEACE,*,ACPR1,
X5      ACPR2,ACPRH,ACPRC/8)TLABF,LFPE1,LFPE2,LFPHS,LFPCE,*,NSEN1,NSEN2,
X6        NSENH,NSENC/9)*,CPSD1,CPSD2,CPSDH,CPSDC,*,SDSR1,SDSR2,SDSRH,
X7        SDSRC/10)*,ELSE1,ELSE2,ELSHS,ELSCE,*,SURE1,SURE2,SURHS,SURCE/11)
X8        DEMLB,DEME1,DEME2,DEMHS,DEMCE,*,CPSL1,CPSL2,CPSLH,CPSLC/12)
X9        RCDLB,DCPD1,DCPD2,DCPDH,DCPDC,*,DDLS1,DDLS2,DDLSH,DDLSC/13)
X10       NXPDY,RCPDY,DESCP,RQCPY,*,OUPUT,NPDL1,NPDL2,NPDLH,NPDLC/14)*,
X11       SIPDY,MINCP,MAXCP,T,RCOUT,DROUT,MXRCO,LEVIN,TOGNP
```

Note: Not included are plotting instructions as used to provide output similar to that presented earlier in the report. These may be constructed as desired with a simple format described in the user's manual for DYNAMO. They are deleted here since they refer to dummy variables used to construct cumulative plots, which may be confusing in presentation.

THE ROLE OF THE FEDERAL GOVERNMENT IN TECHNOLOGICAL FORECASTING

Prepared for the Commission
by
The Interagency Task Group on Technological
Forecasting in the Federal Government
Washington, D.C.

CONTENTS

Page
Summary III-195
Introduction 196
I. The problem 198
II. The development and use of manpower 203
III. Manpower adjustment 205
IV. Primary education and training 208
V. The Federal Government's internal concern with the development and use of manpower 212
VI. Job-creation: law and policy affecting manpower 214
VII. Summary of findings 216
VIII. Recommendations 220

Appendixes:

1. Methodology 223
2. Bibliography of Technological Forecasting 235

Role of the Federal Government in Technological Forecasting

Summary

In February 1965 an interagency task group was formed reporting to the President's Committee on Manpower and to the National Commission on Technology, Automation, and Economic progress. Its purpose was to investigate the current role and the possible future role of technological forecasting in the Federal Government, with particular emphasis on the relevance of technological forecasting to manpower problems, policies, and programs. Specifically, the investigation was to focus on:

1. Action points in Government at which technological forecasting might be useful and used if available.
2. Criteria for information at those action points.
3. Current technological forecasting activities and methodologies and their adequacy to Federal requirements.

From its findings, the task group was to make recommendations related to the conduct of technological forecasting programs in the Federal Government.

Findings

1. By "technological forecasting" we mean the forecasting of technological change; specifically, the forecasting of invention, innovation, or diffusion of technology. But technological forecasting per se is neither much practiced nor of much interest to Government. Starting with the action points in Government where technological forecasting might be used, what is principally of interest is the forecasting of factors such as occupational demand, employment, or industrial growth, where technological change is only one component and frequently a minor component.

2. In examining the kinds of forecasting relevant to manpower activities, it is helpful to envisage an informal national manpower system which includes Federal and non-Federal, public and private programs and policies for the formation and development of skilled manpower, the creation and restructuring of jobs, and manpower adjustment activities mediating between manpower supply and demand.

3. The activities of the manpower system, particularly those of manpower adjustment, occur primarily at the local, municipal, and regional rather than at the national level. Improved forecasting capability could be useful at the local level. National forecasting efforts should serve primarily to provide inputs, national in scope, to local programs, and secondarily as guides to deliberation over certain national manpower policy questions.

4. At the local level, there is a need for the following kinds of forecast information:

> More complete, reliable, and up-dated information than is now available concerning specific job openings in municipal areas, coupled with descriptions of skill and training requirements;
>
> 1- to 5-year forecasts of specific occupational requirements in municipal areas as guides to local manpower adjustment (guidance, training, and employment service) activities;
>
> 1- to 10-year forecasts of regional trends affecting manpower by broad industrial and occupational categories, as guides to local agencies for anticipating and ameliorating manpower dislocations.

5. At the national level there is a need for information, national in scope:

> As an input to local efforts, national trends in manpower supply, productivity, Federal policy, Federal purchasing policy, and the like;
>
> as an aid to the development of modified curriculums for general and vocational education and for forecast information concerning skill requirements 1 to 10 years into the future for broad classes of occupations;
>
> as an aid to Federal policymaking in the development of models of the manpower system.

Long-term (5 to 20 years) forecasting of specific occupational requirements is unlikely to be used or to be methodologically feasible. Long-term forecasting of occupational requirements increases in credibility as it increases in generality. More flexible vocational training designed to help students adapt to broad classes of jobs and to change of job is a more feasible strategy than vocational training based on long-term, specific occupational forecasting.

6. In all of these cases, there are constraints on the effective use of forecast information. These include:

> Absence of agencies or organizations able and willing to use such information as a guide to action;
>
> pressures on agencies and individuals in the manpower system to base decisions and actions on factors other than forecasts; specifically, the pressure to respond to immediate problems, which means that we usually confront manpower dislocations after the fact;
>
> problems in interpreting available forecasts;
>
> concern with the believability or, conversely, the self-fulfilling character of forecasts;
>
> lack of well-defined objectives for manpower activities; hence, lack of measures of forecast utility.

Efforts to develop more effective forecast information should be coupled with efforts to eliminate these constraints on its use.

7. The most relevant form of technological change as a component of the kinds of forecasts outlined above is the diffusion of technology already in use. No technology not already in use is likely to be significant alongside other nontechnological factors for events from 1 to 15 years into the future.

In general, technological diffusion now enters into forecasts as a judgmental factor modifying some baseline trend; e.g., growth of GNP, production, labor force, or productivity. Judgments about rate and direction of diffusion of technology are generally derived from expert opinion gathered systematically or haphazardly.

The more promising efforts at forecasting the diffusion of technology are those which treat technological diffusion as one factor in a more complete dynamic system and attempt to develop models of the larger system. An example is the attempt to develop changing production coefficients for input-output economic models.

8. Many Federal policy and program decisions other than those directly related to manpower would profit from the use of models and forecast techniques which include technological change as a component.

Introduction

In February 1965 the President's Committee on Manpower and the National Commission on Technology, Automation, and Economic Progress established a task group to study the actual and potential use of technological forecasting in the Federal Government with special attention to its application in the development and use of manpower. The task group's first working paper set forth its objectives and scope as follows:

> *The present situation:* Considerable effort is now underway among the agencies to undertake, use, and do research on technological forecasts. Although the Departments of Labor and HEW are primarily involved at present, other agencies, such as Commerce, NSF, and even NASA and DOD, have an interest in the subject and activity underway. With the formation of the National Commission on Technology, Automation, and Economic Progress, technological forecasting is bound to receive more attention.
>
> The interests of these agencies in technological forecasting are diverse. The uses they want to make of technological forecasts vary. To a considerable extent, technological forecasting and research on it is being done in the absence of a clear sense of the uses to which the results are to be put. There is no present focus to the Federal efforts. The various approaches suffer from lack of a theory into which data can fit. There is a need for review of the various practical methods which have been developed and tried.
>
> The following tasks should be undertaken under the auspices of a subcommittee of the President's Committee on Manpower to help put the Federal effort in this field on a sound basis:
>
> 1. Inventory the efforts now underway in the Federal Government, the results which have been achieved, the funds now available for this purpose, and the men knowledgeable and skillful in the field.
>
> 2. Examine the action points at which the agencies concerned wish to use information resulting from technological forecasts; e.g., planning curriculums for national and technical training schools, anticipating labor-management problems, planning retraining and relocation, etc.
>
>> To what extent is lack of information a limiting problem in the effectiveness of these programs?
>>
>> Are they currently using effectively the information already available?
>>
>> Assuming that they require and can use this information, what kinds of information, specifically, could be most useful (in terms of; e.g., leadtime of forecasts, regional specificity)?
>
> Out of this analysis, determine:
>
>> Whether the problems of these action points justify further effort at technological forecasting;

if so, what the specific requirements of forecasts are;

how the various agency requirements overlap or otherwise relate to one another.

3. Explore the benefits that could be obtained, current programs aside, if technological forecasts were available in varying degrees of precision, breadth, and content.

4. Formulate a description of the specific objectives relating to current and possible future programs of the Federal Government's efforts in technological forecasting.

5. Review methodologies employed, both in Federal Government and by non-Government groups in industry and universities, for making technological forecasts of various types.

What are the major data sources?

What are the principal methods for collecting data?

What theory of the effect of technology on the firm has been used—and is available—for interpreting the data collected?

What use has been and can be made of modeling and simulation techniques in technological forecasting?

What methods are appropriate to the Federal Government's objectives for technological forecasts? What methodological gaps require most pressing attention?

6. What would be the form, scale, and content of a balanced and coordinated Federal program in technological forecasting?

The task group was made up of the following members: Seymour Henig, Department of Commerce; Pamela H. Kacser, Office of Education, Department of Health, Education, and Welfare; Evelyn Murphy, Department of Commerce; Donald Schon, Chairman, Department of Commerce; Robert Stern, Department of Commerce; William G. Torpey, Office of Emergency Planning.

Many individuals inside and outside the Federal Government helped the task group in its inquiry. We would like to give special thanks to Garth Mangum of the National Commission on Technology, Automation, and Economic Progress and to Arnold Nemore and Leon Greenberg of the Department of Labor.

I. The Problem: Forecasting and Technological Forecasting

By technological forecasting we mean the forecasting of technological change. The technology which changes is the set of tools and techniques—"hard" as in the case of new machine tools, or "soft" as in the case of new computer programs or methods of work—by which we extend human capability. The process of change can be divided conveniently in what is now a conventional pattern into invention (the creation of a new product or process), innovation (the first introduction of that product or process into use), and diffusion (the spread of the new product or process beyond the first use). Technological forecasting, therefore, is the forecasting either of invention, innovation, or diffusion of technology. We will speak of "forecasting" as the simple assertion that technological change, in one of these senses, will occur; and we will use "projection" to mean the conditional assertion that it will occur if certain other conditions are fulfilled.

Our first finding is that technological forecasting in this sense is practiced very little, and is of little interest to potential users inside or outside the Federal Government.

What is of interest, and what frequently passes for technological forecasting, is the forecasting of something else—industrial growth, for example, or employment—of which technological change is one component. A great many organizations as diverse as industrial corporations, banks, investment firms, labor unions, and Government agencies, undertake such forecasts and are very much interested in their results. Research on forecasting methodology, in this sense, is underway. Such forecasts might be called technology related. In fact, technological change is so closely linked to any social or economic factor we might choose to consider that no prediction about the one can be made without implicit or explicit assumptions about the other. An apparently nontechnological economic forecast rests on the assumption that there will be no economically significant technological change counter to the forecast. But technological change may be, in many forecasts of the greatest interest is, of relatively minor importance to what is being predicted. We will be talking simply about "forecasting," therefore, with the understanding that all of it is in some degree related to technological change, and we will distinguish it from technological forecasting per se.

Technological Forecasting

Most technological forecasts are concerned with invention or with the diffusion of invention already in being. There are few occasions when the effort is made to predict the first use of an invention without attempting to predict some aspect of its diffusion as well.

Predictions of invention fall generally into the category of informed opinion based on grasp of a complicated field and offered as though the field had a life of its own. In the simplest cases, these are simply one man's opinion, as in Dennis Gabor's *Inventing the Future.*[1] In other cases, opinions are pooled or averaged, as in the recent Rand Corp. study.[2] In the Air Force effort, Project Forecast, opinions are gathered from experts about development of new phenomena, effects, or materials whose implications for possible future systems (aircraft, for example) are then more or less systematically worked out. There is no adequate theory of invention, and, in one sense at least, such a theory would be a contradiction in terms, because it would require inventing things before they are invented. Invention, not forecasting, would be at issue then. Nevertheless, according to the view proposed by Ralph Lenz, and others, technological parameters—engine thrust-to-weight ratio, for example—plotted over long time periods exhibit logarithmic growth. Fuller and Lenz would both profit continued logarithmic growth and the inventions necessary to make that growth possible, unless some reason is found to deviate from the curve. Deviations can always be explained, however, on the grounds that the wrong parameter was chosen for analysis.

Most technological forecasts do not forecast invention. They assume invention—in fact, they usually start with invention already introduced—and go on to predict rate and/or direction of diffusion. This bears a relation to the possible utility of technological forecasts: In general, the time period of diffusion is so long (from 15 to 50 years, in most instances, depending on the character of the technology and the circumstances of its introduction) that if we are concerned with doing something about technological change, we have little reason to be interested in any technology that has not already been brought into use.

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[1] Gabor, Dennis, *Inventing the Future,* New York, Alfred P. Knopf, 1964.

[2] For full citation of all references, see bibliography, app. 2.

There are a variety of approaches to forecasting rate and direction of diffusion of technology.

One approach analyzes historical diffuson curves (some measure of use—dollar volume, number of units in use, or the like—plotted against time). It then goes on to identify characteristic curve shapes (as in Roger's work on agriculture) [3] or formulate conditions governing rate of diffusion (as in Mansfield's studies). Either could be used to forecast diffusion—again assuming that the technology acted as though it had a life of its own—but neither, to our knowledge, has been much used in this way.

A second approach tackles diffusion of technology on an industry by industry basis, or even a product by product basis. Approaches of this kind have been taken by the Bureau of Labor Statistics in its "36 Industry" study, by Corplan Associates in its studies of industries in the Chicago area, in BLS's study of numerical controls, and in Peter Haase's study of three industries for the Department of Labor.[4] In a sense, ordinary industrial market forecasts embody diffusion forecasts since the process seen from the outside as diffusion of technology is seen from the point of view of the producing company as the generation of market. In each instance, the forecast is undertaken for the sake of assessing the effect of technological diffusion—on manpower, industrial growth, or corporate profits, for example.

Studies of this kind usually take an eclectic approach. It is assumed that rate and direction of diffusion are functions of total market available over time, or total potential applications. These are seen as varying with some features of the user community: Rate of growth of population, rate of growth of user industries, etc. There may also be an effort to take into account the number of "units" already introduced, the rate at which they have been introduced, the percentage of untapped market remaining, the capacity of producers to make the new unit, the economics of introduction of the unit, competitive pressures for its introduction, competing technologies, and characteristic trends of users with respect to the replacement of capital equipment. These are only a few of the factors which may be and often are relevant. In addition, there are problems about defining potential markets (there is often invention in the choice of potential application itself), and identifying potentially competitive technologies. (Forecast of the rate and direction of diffusion of a particular technology implies forecasts of the new technologies it may compete with, and of the rate and direction of *their* diffusion.) Unanticipated events—shifts in corporate or Government policy, consumer preference, wars, etc.—may affect forecasts adversely. Moreover, there are difficulties in the confirmation of such forecasts. In the case of market forecasts, there is a special problem about confirmation since action taken on the basis of the forecast may influence the trends forecasted. In general, efforts at forecasting of this sort attempt to juggle variables in an intuitive manner, to "Gestalt" the process rather than to present themselves as applications of rigorous theory.

Depending on the criteria chosen for accuracy, the timespan of the forecast, or the degree of technological novelty involved, a forecast of this kind has a greater or lesser chance of succeeding. For example, forecasts of the rate and direction of diffusion of synthetic fibers over the next 5 years have a high probability of being accurate to plus or minus 15 percent. Forecasts of the rate and direction of diffusion of numerically controlled production equipment over the next 10 years have a much smaller chance of being right within that margin of error. The likelihood of technological forecast success is directly proportional to the allowable margin of error and inversely proportional to timespan.

The diffusion of technology is a process in a total complex economy and, more broadly still, in a total and complex culture. The most interesting approaches to forecasting technological diffusion are those which attempt to locate diffusion in these contexts.

There are several approaches here as well.

It is possible to deal with technological diffusion at a very high level of aggregation and abstraction. While productivity (grossly taken to be gross national product divided by the number of workers working) is a function of many factors in addition to technological change; change in productivity can be taken as an index of at least one kind of technological change. Projections of national productivity, such as those undertaken by BLS, are in this sense projections of technological change. In comparison to the diffusion of particular technologies, it is possible to be relatively accurate about forecasting national productivity. It is reasonably safe to say, for example, that national productivity will increase, on the average, at between 2.5 and 3.5 percent per year over the next 10 years. But small differences and deviations from the average can be of critical importance with respect to the uses to which such forecasts may be put. Again, productivity projections are Gestalt processes which combine productivity trend extrapolation, consideration of output and manpower trends, and trends in demand for goods and services in capital investment and the like.

At a lower level of abstraction and aggregation, efforts are now underway to adapt the techniques of input-output economic analysis to projection of technological diffusion. In the work of Leontief and Wood, for example, the attempt is being made to incorporate changing as opposed to static input-output coefficients in models of the national economy. These changing coefficients would reflect changes in production processes significantly dependent on introduction of new technology. Models of this kind would be used to provide more accurate projections of economic development; but they would also be used to provide more accurate projections of diffusion of production process technologies through iterative processes in which economic change is fed back to influence projection of technological diffusion. Wood's current work concentrates on technological change in the form of introduction of new capital equipment. Introduction of new capital equipment is seen as a function of average age of existing equipment or demand for industrial output relative to existing capacity: The productivity characteristics of available new equipment in particular industrial fields would then be fed into the model to permit projection of change in process coefficients.

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[3] Roger, Everett M., *Diffusion of Innovations*, New York Free Press, 1962, p. 367.

[4] *Technology and Manpower in the Health Service Industry, 1965–75; Technology and Manpower in Design and Drafting, 1965–75; Technology and Manpower in the Telephone Industry, 1965–75;* U.S. Department of Labor, 1966.

Forecasting

As we have said, there is no social or economic forecasting to which technological change is not possibly relevant. There is a great variety of actual and an indefinite variety of potential forecasts of interest to Government and other institutions. These are most easily grouped according to the uses made of them.

All forecasts are used principally for planning. In the Federal Government the planning may be for either specific programs or broad policies. We have found it convenient to group forecasts of interest to the Federal Government into those concerned with program and policy planning for use of natural resources, industrial growth and development, national and regional economic growth and development, manpower supply and demand, and research and development. Appendix 1 discusses in some detail the forecasting efforts and methodologies associated with these areas.

In spite of their various uses, most of these forecasts share a common methodological approach. Certain baseline trends—growth of gross national product, labor force, productivity, and the like—are taken as basic and extrapolated to some future time, which defines the forecast's timespan. These trends are then modified by other trends that are quantitatively described, or by qualitative judgments covering other factors. Considerations of technological change usually enter forecasts as judgmental factors of this kind, modifying a basic trend in output, productivity, or the like. In forecasting demand for manpower in specific occupations, for example, a basic analysis is made by projecting demand for goods and services in particular industries and productivity in those industries. But this baseline projection is modified then by such considerations as projections of retirement rate and restructuring of jobs through technological change.

Again, forecasts become more interesting and more convincing as they become more nearly complete. The efforts by Resources for the Future, Inc., to predict trends in the Nation's use of natural resources gain in credibility because they juxtapose trends in resource utilization throughout the economy as a whole. Predictions of the future use of aluminum in automobile engine blocks must be tested against predictions in the use of steel for the same purpose; these comparative projections must stand up in the light of projected production methods, costs, and properties for both metals.

Methodological Problems

It will be useful here to outline some of the practical and theoretical obstacles to effective forecasting. These apply in varying degrees both to forecasts generally and to technological forecasts in particular.

(1) Efforts at forecasting are plagued by lack of appropriate, uniform, complete, credible, and timely data. There are little reliable, uniform, credible data, for example, about the economic and process characteristics of new production equipment. This lack is due both to the absence of formats for standard data, mechanisms for collection and analysis, unwillingness of producers to reveal information they consider proprietary, or even lack of methods or willingness to generate such data in the first place. Getting the data in time may be as critical as getting them at all, as when we attempted in 1965 to make forecasts to 1975 on the basis of 1958 data.

(2) There is currently no adequate theory of technological change which spells out necessary and sufficient conditions for such change, nor is there any particularly promising candidate. Technological change cannot be well understood and certainly not anticipated if it is assumed that it behaves as though it had a life of its own. Any instance of technological change can best be understood as an event in a total social-economic-technical system. We know enough about such systems to understand that they are characterized by large numbers of interdependent variables, that these variables change according to differential rates, that small rate changes may be highly significant for the system as a whole, and that the system is characterized by dynamic feedback so that in complex ways it is self-controlling.

Efforts at understanding technological change are now fragmented: Economists tend to look at a small number of relevant factors, such as trends in output and demand relative to capacity; technologists and students of technology tend to look at technology as though it had a life of its own; sociologists tend to relate technology to social systems characteristics. To our knowledge there is no current effort toward the development of a more nearly complete theory.

(3) In the absence of adequate theory, forecasting—including technological forecasting—relies on the projection of trends related to a small number of variables modified qualitatively by intuitive judgments. Such forecasts or projections always raise sharply the question whether the future for those few variables will be like the past. We can observe rates of increase in productivity over the last 25 years, for example, and make trend projections into the future. Such projections, however, are always open to these sorts of questions: Will the productivity trend in the short-term future exhibit rates of increase which have held only on the average for long periods in the past? Will these average rates of increase continue to hold, or will they shift? Will manufacturing productivity, for example, behave as it has on the average over the last 10 years, or will it change so as to approximate the long-term curve for agricultural productivity? With respect to manufacturing productivity, what kind of a curve are we on? Where on the curve are we?

There are special problems about the prediction of rate of change, such as rate of diffusion. There is a lack of information as a basis for rate projections. Characteristically, predictions of rate of diffusion tend to be optimistic for the short term and pessimistic for the long.

When we come to anticipate the effects of the interaction of trends—such as, for example, rates of expansion in automotive use of steel and aluminum—we are in the position of weather forecasters who are able to predict movement of fronts with reasonable accuracy but who lack adequate means of anticipating the outcome of their collision.

(4) In principle, is it possible for there to be an adequate theory of technological change? Suppose an adequate theory to be one that presents necessary and sufficient conditions of technological change and permits prediction with a high probability of accuracy.

There is a special problem about any theory that presumes to permit prediction of invention. In one sense, a prediction of invention *is* invention; the prediction then fulfills itself, and the claim that a theory permits prediction of invention becomes a claim that a theory permits invention. On the other hand, the prediction of invention may mean only prediction of some characteristic of invention (such as numerically controlled textile machinery) or an objective of invention (an increase of 50 percent in thrust-to-weight ratio for aircraft engines) without specifying the means for accomplishing it. Such predictions then hinge on judgments about technical feasibility, cost, willingness, and alternative research routes, among many other factors, and share the problems of any theory that claims prediction concerning the future states of complex socioeconomic-technical systems.

It is by no means clear that such systems are in fact rational and convergent and that they lend themselves to theories from which accurate predictions can be drawn. We may act as though they were, but our behavior rests then on an ungrounded methodological assumption. The observation that certain patterns have held historically provides no basis for assuming future rationality when the very matter at issue for social systems is whether their future will be like their past.

We operate always from within the most deeply held assumptions—what McLuhan calls the "spell"—of our own society. The mechanistic, visually oriented biases of those who looked toward the future in the 18th and 19th centuries are apparent to us now. We can only assume that in our own time we operate under a similar spell whose nature we will perceive only as we begin to emerge from it.

Predictions about significant aspects of our future, particularly when a prominent public institution such as Government makes them, may tend to fulfill themselves, or at least to influence the system they claim to be about. Forecasts may function as self-fulfilling or self-defeating prophecies. There is evidence, for example, that predictions made in the fifties concerning imminent shortages of scientists and engineers produced a change in patterns of enrollment in graduate schools of science and engineering, which has, in turn, produced surpluses. Any prestigeful public utterance of this kind about the future is likely to affect people's behavior. Alleged predictions become performatives. This is a kind of uncertainty principle in the realm of social systems.

Attitudes Toward Forecasting

In the light of such considerations, many economists and social scientists maintain that forecasting, technological or otherwise, is either impossible or undesirable. Others, less concerned with the dangers of self-fulfilling prophecy than with methodological inadequacies, assert that significant forecasting is premature. Years, they claim, will have to be spent in developing theories of social development and technological change in particular before we can begin to talk about meaningful forecasts.

But a second view, although it admits the weakness of current forecasting methodology, emphasizes the ways that the conduct of public and private programs requires planning and forecasting as necessary ingredients. If managers must make policy and program decisions which will have future impact—such as decisions about long-range Federal policy or investment in research and development or productive capacity—then for better or for worse, they base their decisions on forecasts. Research and development investment decisions imply forecasts about the relative utility of alternative technical routes. Decisions about educational and training curriculums imply certain assumptions about future requirements for skill and knowledge. Such forecasting assumptions are often unavoidable, in the sense that even the decision not to make them carries with it the implicit assumption that relevant present conditions will not change within the range of the forecast.

It should be noted that not all Federal decisions are of this kind, but only those which suffer from being made after rather than before the fact. The decision to provide welfare payments and unemployment insurance, for example, rests on certain broad assumptions about the future, but these assumptions have very little specificity. The decision would not necessarily be unwise, even if the occasion for making a payment never arose. And, except within very broad limits, the success of the policy does not depend on Government's anticipating how many people will request such payments, or when or where they will do so. On the other hand, training and counseling programs are designed to act in anticipation of future events and rest implicitly or explicitly on assumptions about future employment requirements. Decisions about policies and programs should be made with an eye to the kind of forecasts their successful implementation would require. If a program or policy requires accurate, specific, long-range forecasts, that is a strike against it.

Nevertheless, there are many program and policy decisions in and out of Government which rest unavoidably on assumptions about the future, including assumptions about technological change. We should, therefore, address ourselves to the forecasting task as explicitly and intelligently as possible. This implies, from what has been said above, that:

> We see forecasts as tools or aids for decision rather than as assertions about the future;
> we look to forecasting tools in their present state for insights rather than for answers;
> we guard against the public use of forecasts as self-fulfilling prophesies;
> we seek to improve forecasting methodology by (*a*) determining data requirements and improving data availability, (*b*) developing more nearly complete theories of the social-economic-technical systems we are interested in, and seeking to merge the currently specialized professional approaches to them, (*c*) regarding technological change as only one component of the events we are interested in, and seeing technological change as a feature of complex social-economic systems, and (*d*) devoting attention to testing and confirming or disconfirming those forecasts which have been and are now being made.

There is a tendency among those interested in forecasting methodology to concentrate on methodology rather than on its use. Our approach will be to begin with potential use and user requirements, and then to move to relevant methodology.

While we will concentrate on the potential use of forecasting in the development and use of manpower some of our recommendations will go beyond this field. With relation to manpower, we will ask:

(1) What are the principal Federal forecasting requirements?

(2) What are the characteristics of these forecast requirements especially with respect to time range, specificity, and reliability?

(3) In the light of practical constraints on the use of information resulting from forecasts, what events or trends is it worthwhile trying to forecast?

(4) What is the feasibility of forecasting, given currently available methodology? What improvements in methodology would be most relevant for Federal purposes?

(5) To what extent do Federal forecast requirements overlap?

(6) In the light of the above, how should the Federal Government design and coordinate its forecasting activities?

II. The Development and Use of Manpower

In speaking of the development and use of manpower, we mean the activities we undertake as a nation which affect the availability of trained manpower and its adequacy to meet occupational requirements. Among the measures of the effectiveness of these activities are the rate of unemployment and the availability of skilled men to do the jobs which need to be done. These activities are of three major kinds:

(1) *The development of skilled manpower.* This includes programs of education and training, as well as legislative and regulatory policies and practices which affect the supply of people available and desiring to do work (e.g., immigration policy, child labor laws, minimum wage laws).

(2) *Job creation.* This includes activities which create requirements for people to do work. From the point of view of the Federal Government, they include: (*a*) Policy, such as monetary and tax policy, which affect the overall demand for labor, (*b*) specific missions which need skilled manpower—e.g., Defense, NASA, (*c*) job creation programs designed to relieve unemployment; e.g., the Economic Development Act and Appalachia, and (*d*) other policies which affect occupational requirements in the U.S.; e.g., import/export.

(3) *Manpower adjustment activities.* These mediate between manpower supply and demand by (*a*) providing information about manpower supply and demand (guidance, employment service), (*b*) retraining for employment, and (*c*) softening the blow of unemployment and promoting labor mobility.

These activities do not constitute a formal system because they are not all presently directed to a single, well-defined set of objectives, nor are they closely controlled by feedback derived from measures of their effectiveness in meeting these objectives. Nevertheless, they do interact and are broadly related to the objectives of reduced unemployment and trained manpower equal to demand. In this sense, they may be said to constitute the Nation's informal manpower system.

The usefulness of technology-related forecasting will have to be evaluated for all of these activities with respect to the two objectives of the system: The extent to which it may help to reduce unemployment and, perhaps also, underemployment; and the extent to which it may help to provide trained manpower adequate to demand.

Organizations

Although there is no 1-to-1 correspondence between the functions of the informal manpower system and organizations inside or outside the Federal Government, we can identify some of the organizations with programs related to these functions.

Manpower development and training. Primary education and vocational training—that is, education and training undertaken for the most part prior to the student's entry into the labor force and designed, in part, to prepare him for that entry—are the province of the public and private elementary, secondary, and vocational schools, junior colleges, colleges, and universities. At the State level, departments of education coordinate and make policy for State programs. The Federal Government affects education and training through support of faculty and students, curriculum development, facilities, and research. Although 43 agencies are currently involved in education in varying degrees, only 2—the Office of Education and the National Science Foundation—have education as a primary concern.

Laws and policies which affect the supply of people available to do work—child labor laws, immigration policy, laws governing membership in labor unions, and the like—are generated through the Congress and administered by appropriate Federal and State agencies.

Job creation. Overall monetary and fiscal policy affecting demand for labor is determined by Federal agencies such as the Treasury, the Federal Reserve bank, the Bureau of the Budget, and the Council of Economic Advisers. Specific agency missions which are in themselves sources of significant labor demand—NASA and DOD—anticipate their own requirements. Programs of public works frequently initiated by the President or the Congress are administered by various agencies; e.g., the Bureau of Public Roads, the Economic Development Administration, and corresponding State agencies. Beyond these Federal functions, job creation is, of course, the province of the whole private sector of the economy.

Manpower adjustment. It is difficult to separate vocational training and retraining organizations. Retraining is undertaken by many primary training institutions—secondary schools, vocational schools, and junior colleges, as well as by corporations, labor unions, and State and Federal agencies. Consulting and guidance functions are performed by schools at secondary, junior college, and university levels; by employment services; and by certain State and Federal agencies. Activities aimed at softening the blow of unemployment, including promoting mobility of unemployed workers, are undertaken by Federal and State agencies which provide financial support for workers, help them to locate new jobs, or support their travel to new jobs. To some extent these functions are also performed by companies responsible for layoff of employees, by labor unions, by social welfare organizations, and by such associations as the National Association of Manufacturers.

In general, manpower adjustment activities operate principally at the local level. There are chains of financial support, law, policy, and information which connect Federal with State programs (guidance, employment service, and training), university programs (training counselors and trainers), schools at all levels, and private organizations such as companies, unions, banks, and civic groups.

Interview Plan

Within the limits of our inquiry, we have tried to obtain a representative sample of individuals and organizations involved in the development and use of manpower as described above.

About 70 interviews were conducted in Federal agencies concerned either directly or indirectly with the development and use of manpower, and with departments of labor and education of several State governments. Another 60 interviews were conducted in six municipal areas (Atlanta, Boston, Chicago, Denver, Los Angeles, Washington) covering high schools, vocational high schools, junior colleges, public and private employment agencies, companies, and labor unions. We also interviewed companies, unions, associations, and other groups specifically concerned with programs to ease the blow of employment or to encourage reemployment.

Findings

We will examine the actual use of technology-related forecasting, constraints on the use of such information, and the characteristics of desirable information for each of the major functions listed related to the development and use of manpower. Functions of the Federal Government in this area can be divided into external—relating to manpower other than as required for Federal missions—and internal. The latter will be handled separately. Recommendations are found in section VIII.

III. Manpower Adjustment

The following are broadly applicable findings concerning manpower adjustment activities.

The cutting edge of the retraining, guidance, and other activities mediating between labor supply and demand—the place where actual manpower adjusting is done—is primarily at the local level: Counties, municipal areas, towns. National, Federal, and State programs serve primarily to provide resources (dollars, people, and information) for local programs or to set guidelines for them.

With respect to guidance and training, there are informal mediators—families and peer groups, for example—which are at least as important, and possibly much more important, to decisionmaking and end results than the formal programs of schools and employment services.

There is little or no interest among those concerned with manpower adjustment in technological forecasting per se but only in forecasting availability of manpower, occupational demands for skilled manpower, and/or requirements for entry into an occupation. Technological forecasting is interesting here only as a route to these types of forecasts. Technology is only one of many factors influencing available manpower or occupational demand. Hence, technological forecasting is only part of the most useful forecasting, which is total forecasting of occupational demand or manpower availability.

The use of technology-related forecasting in manpower development and adjustment should be considered from two viewpoints: As a service to mediating activities essentially as they are, and as a service to such activities as they might be some time in the future. Because the latter requires rationalizing the total manpower development and adjustment system, it is not considered here. Our consideration of technological forecasting relates to manpower development and adjustment activities essentially as they are—improved, perhaps, but not radically different from their present form. Later analyses of the Nation's system for using and developing manpower may permit a longer range treatment of the possible role of technological forecasting in that system. We will return to this point in the summary of this section.

Specific Findings

Helping people find jobs

1. The information requirements of middlemen such as local counselors, vocational trainers, unions, and employment services are extremely short range. They range from 0 to 10 years into the future, with the great majority from 0 to 5 years.

Forecasting time-spans required by middlemen

For assisting	*Years*
Unemployed	0.
Dropouts	0.
Vocational students	0 to 2.
Junior college students	0 to 6.
High school students	0 to 10.
Employed	0 to 10.

2. The geographical scope of interest of these middlemen is narrow, with primary emphasis local; i.e., metropolitan areas.[1]

There is interest among State departments of education and labor in generating and using statewide and regional information about demand for manpower by occupation, and there is some interest in using this kind of information at the local level. But it is not clear how this information could be effectively translated into action by those at the local level who have the responsibility for helping people to find jobs.

At the university level and beyond, the geographical scope of information required for counseling is broader, extending regionally and nationally.

3. Information about demand for labor available to local agents includes:

a. Reports from employers of immediate job opportunities and vacancies.

b. Local, short-range projection by banks, civic groups, businessmen, utility companies, and others, about number and kinds of occupational demands which will hold for the local area.

c. In some States, statewide labor-market data are used to make short-range projections of occupational demands.

d. National projection of occupational demands and manpower availability by skill level—primarily from Census, Labor, and HEW.

e. U.S. Employment Service area skill surveys and other local projections of occupational demand.

4. At the local level, this information is used sporadically and inadequately.

5. The reasons for this inadequate use of existing information are:

a. Local mediators have difficulty translating it in terms of local occupational demand.

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[1] This emphasis is consistent with labor market studies of geographic mobility patterns.

b. Where there is an emphasis on vocational guidance—vocational schools and employment services—requirements for immediate placement take priority.

c. In high schools and junior colleges where there is not an emphasis on vocational guidance, guidance toward occupation tends to take a back seat. The ratio of students to counselor is high (300:1 to 600:1) and other guidance functions—for example, attention to student aptitudes and interest in further education and personality problems—tend to take priority.

d. There is difficulty in interpreting occupational forecasting information to the student; it is not clear to counselors how this can best be done.

e. Student attitudes and interests—shaped by family and peer attitudes, relating as much as anything to occupational status—tend to be more important than information about occupations in determining the directions in which jobs will be sought.

6. But a great deal of the information about occupational demand—short range and local—is potentially available to meet local demand. For more effective use, it would need to be synthesized, made centrally available, regularly updated, related to prevailing wage rates wherever possible (much current data about occupational demand is far less useful than it might be because it is unrelated to wage rate), well advertised, and coupled with help in interpretation to those seeking employment.

Acting to soften the blow of unemployment

We mean here ameliorative actions taken in response to a threatened or an actual dislocation of workers. The action may be taken by companies, governments (local, State or Federal), labor unions, welfare organizations, or others. By and large, they include:

1. Financial help to workers out of a job to keep them going and aid them in seeking employment elsewhere. This aid may take the form of welfare payments, unemployment insurance, loans, and relocation allowance supporting the worker's travel to a new job. Government is the principal source of this aid.
2. Special ad hoc efforts to help those out of work find new jobs—for example, by setting up job information and guidance centers, canvassing potential employers of a region, and the like. These efforts may be undertaken by governments, companies, or community groups, among others.
3. Ad hoc retraining programs designed to help those out of work find reemployment either in the same or in other companies. Such efforts have been undertaken by Government (ARA, MDTA, OEO), companies, unions, welfare agencies, and other organizations.
4. Ad hoc job-creating efforts for the distressed region or locality. These may take the form of placing Government contracts in the region, making loans for the formation or expansion of business, or community entrepreneurial action.

We have inquired into a sampling of such efforts, including programs of the Economic Opportunity Act (the Neighborhood Youth Corps), Manpower, Inc., training programs, Armour & Co. program to relocate displaced employees, West Coast Longshoremen's Union program, National Maritime Union, American Machinist Union, A.T. & T. program, and the South Bend, Ind., program.

Our findings are:

1. There are fewer such programs than might be supposed. Many announced efforts by companies, unions, or agencies to anticipate and ease dislocations produced by new technology or other factors tend on close inspection to evaporate.
2. Many of the actions in this area—specifically, the various forms of financial assistance to unemployed workers—are designed to be applied after the fact of job loss, and suffer little or not at all from being unexpected. They would gain very little in effectiveness if the need for them were accurately predicted.
3. Many of the actions in this area are undertaken, and are best undertaken, by the agency (private or Government) responsible for the dislocation of workers, which has the timing and character of the dislocation to some extent within its control. Depending on the kind of aid involved, the agency's effort to ease the dislocation may well be more effective if it is forecast and prepared in advance. But the agency itself is in the best possible position to do this forecasting. The issue here is its willingness, not its ability, to do so.
4. Broadly, forecasting may contribute to the effectiveness of efforts to ease job dislocations in one of two ways: By guiding the job counseling and retraining which is undertaken, or by enabling an ameliorative agency to anticipate the dislocation where it might not otherwise have done so, and in this way prepare more effective counteraction in the form of job-creating, retraining, or job-finding efforts.
5. Retraining and counseling undertaken in response to job dislocation tend to have very short-term objectives (timespan of forecast is usually 0, but might, if action were taken before the fact, run 2 to 3 years).

6. From the point of view of the affected community or region (e.g., South Bend or Long Island), ameliorative job-creating, retraining, counseling, or relocating efforts are likely to be more effective and less painful to the community if they are prepared in advance of the dislocation. We verge here on the whole subject of community and regional economic development.

If the dislocation results from the closing or reduction of a single plant, the warning time may be inherently short (1 to 3 years) and forecast may be best accomplished by simple communication between the affected plant and the relevant agency.

If the dislocation involves shift of market (such as Government contracts), shift in other economic factors (such as labor costs), or technological displacement (such as the invasion of one industry by another), then the timespan of forecast may be relatively long (from 1 to 10 years, for example).

Similarly, some efforts to ease job dislocation can only be undertaken on a relatively long timespan—for example, job creation through community action. Other efforts, such as retraining workers and seeking Government contracts, are more effective if undertaken on a longer timespan.

From the point of view of the affected community or region, it would be desirable to forecast short-term or longer term local dislocations of workers. Such forecasts could permit more effective remedial action. But in all cases, the utility of the forecast information would depend on the existence of an agency prepared to act on the information. Characteristically, community and regional groups have been prepared to act only after disaster has struck. The effort of forecasts will not be worthwhile unless such groups are prepared to organize and act before the fact.

Nevertheless, it may be argued in this case that the existence of forecasts concerning possible regional and local dislocations would tend to mobilize community action and should be undertaken for that reason, even in the absence of community action groups.

Summary

1. The overwhelming need in counseling, retraining, and "blow-softening" activities is for local (municipal) and short-range (0 to 5 years) information. Such information would serve the interests of local agencies which provide the cutting edge of activities in this area. State, Federal, and national agencies, whose function is principally to provide support and guidance for local efforts, express some interest in longer range information which is more nearly national in scope, but it is unclear how this interest could lead to effective action without radical change in the Nation's manpower adjustment system.

The one observed exception to this statement is the potential use to community or regional action groups of information forecasting job dislocations which may be from 0 to 10 years away and may affect whole regions as well as municipalities.

2. Information relevant to short-range, local needs is potentially available, but not assembled or interpreted, and tends not to be used because of lack of synthesis and central availability, inability to interpret such information to clients or students, and conflicting influences either on student decision or professional actions.

IV. Primary Education and Training

For the purpose of this report, we will discuss three kinds of primary education and training:

> General education at the levels of primary, secondary, junior college, and university institutions.
>
> Vocational education and training, which may be at secondary and junior-college levels or, where the vocational training is professional, at the level of university or post-university training.
>
> On-the-job training.

With respect to such education and training, the role of Federal and State Governments may take the forms of teacher training, support of students, support of curriculum development and design, building facilities, and research. The Government's internal needs for training and education are set aside until a later section.

From the point of view of the flow of dollars, information, and guidance, chart 1 represents a simplified version of the system.

Funds, information, and guidelines flow either from the Federal Government to State departments of education, and then to universities and schools or, in some cases, directly from the Federal Government to universities, schools, and companies.

The Federal Government provides research, information, and dollars for the development and design of curriculums, which it transfers primarily to State departments of education and, through them, to local school boards and schools. (See chart 2.) There is some direct transfer to schools, and some direct Federal sponsorship of curriculum design, particularly in the sciences. Most school boards design curriculums through internal com-

CHART 1. TEACHER TRAINING, FACILITY BUILDING, AND STUDENT SUPPORT

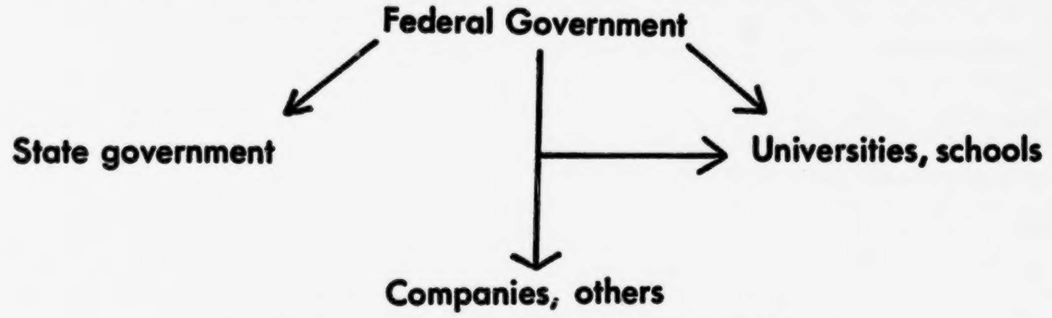
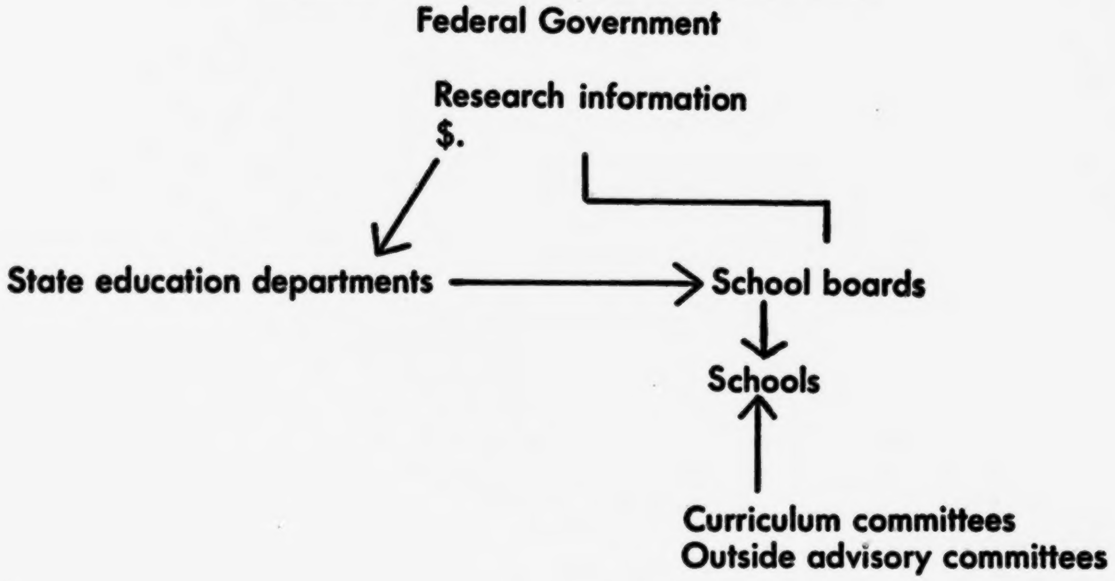

Federal Government
State government
Universities, schools
Companies, others

CHART 2. CURRICULUM DEVELOPMENT AND DESIGN


Federal Government
Research information
$.
State education departments
School boards
Schools
Curriculum committees
Outside advisory committees

mittees, supplemented, in the case of vocational curriculums, by outside advisory committees drawn from labor and business in the community. There is a varying division of labor in curriculum design among the States and among State departments of education, local school boards, and individual schools.

Teacher Training and Educational Facilities

The Federal agencies principally involved here are the Office of Education, which provides fellowships for graduate study aimed at producing teachers and supports facility development for all major fields of instruction, and the National Science Foundation, which supports facilities, teacher training, and students (directly and indirectly through research grants) in the physical and biological sciences and engineering.

The NSF attempts to determine long-range manpower and educational requirements in science and technology. It must set priorities in science and engineering fields where the payoff is new Ph. D.'s produced during a 5- to 10-year period.

The Office of Education grants fellowships for doctoral study aimed at producing teachers. It bases its grants on analysis of faculty-student ratios, presently using 1962 data, balancing efforts to maintain or achieve certain ratios against actual applications received. As with the NSF, the effect of actions will be 5 to 10 years hence.

Both agencies profess dissatisfaction with forecasting information currently available and express interest in information that relates to needs for teachers 5 to 10 years away, is national in scope, and is useful in broad categories; e.g., language, physical science, engineering, etc.

At least two approaches to such forecasts are open here. The first, now used by the Office of Education, starts from present data on faculty-student ratios by broad discipline and calculates future teacher needs by plugging in demographic projections and assuming fixed ratios and constant mix of discipline. The second attempts to forecast future needs for scientists and technologists by broad discipline and to calculate teacher needs on this basis. Teacher needs 5 and 10 years off would then be based on needs for scientists and technologists 10 to 20 years in the future. Efforts in this direction (recently by the National Academy of Sciences, the Department of Labor, and the Engineers Joint Council—see appendix 1) have shown a tendency to project past demand trends into the future in a way that reality does not support. What ought to have been shortage categories turn up as surpluses as the Nation's R. & D. efforts shift direction.

Since World War II, at least, there has been a tendency for graduate enrollments in broad areas of science and technology to shift up or down in response to well advertised present need and then to continue beyond the period of that need, producing a felt surplus. In the cybernetic sense, graduate enrollment has been "hunting."

Curriculum Development and Design

Organization. The development and design (design meaning the choice of specific course items for a given program as opposed to invention of new course item) of curriculums proceeds somewhat as follows. The acting agencies are schools—primary, secondary (general and vocational), junior colleges, universities, professional schools—and companies, unions, associations, or other organizations. Within the State public school systems, there is a varying division of labor among State departments of education, local school boards, and the schools themselves in the development of curriculum criteria and actual curriculums.

From the point of view of the relevance of technology-related forecasting, we can distinguish (1) curriculums for vocational and technical training at secondary, junior college, college, or professional levels. We may also add here curriculums for special vocational training conducted by companies, unions, or other organizations whose functions are not primarily educational; and (2) curriculums for general education and training at secondary, junior college, and university levels, where the function of the education or training is not to prepare directly for work but to lay the groundwork for further training, which, in turn, prepares directly for work. We shall refer to these as "vocational" and "general" curriculums.

Federal agencies involved in curriculum development include the following:

Office of Education: Supports the development of curriculums for vocational, technical, and general programs of training and education; supports the programs themselves; undertakes research in curriculum development for vocational and technical training.

Department of Labor: Supports programs of vocational and technical training in industry, schools, and other institutions; does research on curriculum development in these areas.

Office of Economic Opportunity, Office of Vocational Rehabilitation, Veterans' Administration: Support programs of vocational training.

Vocational training. At the secondary school and junior college level, in companies, associations, and other institutions, our findings are:

(1) Most programs of vocational training are oriented to today's jobs. They are concerned principally with finding employment

for students on graduation, which may be from 6 months to 4 years from enrollment, depending on the type of course. Curriculum decisions are made primarily on the basis of information about employment opportunities at the time of decision, and relate primarily to the school's immediate locality.

The information such decisions are based on includes recommendations of advisory committees made up of local business and labor; information materials from State employment services, particularly area skill surveys (see appendix 1) which attempt to give a picture of current and future manpower requirements in selected occupations, statewide or for major geographical areas, for periods up to 5 years.

(2) In spite of the immediate orientation of most vocational curriculum decisions, there is considerable interest at the level of the training institution itself, as well as at State and Federal Government, in manpower requirement forecasts which are longer term (anywhere from 3 to 10 years, depending on the respondent) and more nearly regional or national in character. It was frequently stated that a major curriculum change would require at least a 3-year leadtime, with the implication that such a change should be based on a 3-year forecast as a minimum. This attitude is coupled with rather widespread dissatisfaction with the information currently available from the point of view of its specificity, interpretability, and (especially as regards occupational outlook) its application to particular localities.

(3) Nevertheless, there is widespread recognition of factors which tend to inhibit the use of such information: The perceived need to design curriculums for immediate placement of graduates; pressures on curriculum committees to make curriculum changes which respond to past needs, with little opportunity to anticipate future ones; the fact that curriculum tends not to change or to change only peripherally; the widespread belief that curriculum design is more influenced by student attitude and interest—often based on family and peer influence—than on data about occupational demand; and the fact that the followthrough required to implement curriculum change (new equipment, teacher training, etc.) based on longer term forecasts may be impractical or impossible.

Professional. The design and development of curriculums for professional training—of lawyers, doctors, scientists, teachers, and the like—differ significantly from lower levels of vocational training.

> Professionals are more mobile, so that professional curriculums ought to be designed from the point of view of national demand.
>
> Demand for some professionals is more closely linked to population trends, so that forecasts of demand for; e.g., doctors, nurses, and teachers, can be made more confidently on the basis of demographic projections alone.
>
> In view of the generally longer period of professioal training (anywhere from 3 to 8 years), curriculum changes ought to be made with longer term forecasts of requirements in mind.

These factors affect planning for the size of professional training programs, numbers of teachers needed, and the like. Within the limits of this study, we were unable to make a thorough analysis of professional curriculum design and evaluate adequacy of existing information. The few inquiries made at this level suggested that similar pressures (student interest, faculty inertia, limited resources) tend to work against curriculum change, and that existing information about the nature of future occupational requirements tends to be seen as inadequate in specificity, timespan, and completeness in coverage of technological trends.

General education and training. There appears to be increasing recognition of the importance of education at college, secondary, and even primary levels which is not aimed at preparing students for specific occupations but that will be important in the student's future occupational experience, either by preparing or failing to prepare him for future vocational or professional training, or by giving or failing to give him certain skills important for broad classes of occupations.

For example, training in certain kinds of mathematics at the secondary school level may be essential to future technical training and may also respond to the requirements of broad classes of technical jobs. General education may be seen as nonspecific vocational education and evaluated accordingly.

There is a great deal of interest among Federal agencies, State departments of education, and local school systems in obtaining forecast information which identifies basic skills and disciplines likely to be required by clusters of occupations 5 to 10 years from the time of decision on curriculum, and is relatively unspecific and regional or national in scope rather than limited to municipality. Again, there is widespread dissatisfaction with existing information resources. The same constraints as those described earlier limit the possible use of this information.

Summary. In vocational, general, and professional curriculum design there is wide dissatisfaction with currently available forecast information about occupational demand on grounds of lack of specificity, interpretability, scope. There is also interest in technologically oriented forecast information at all levels of training and education. For vocational training, the interest tends to be in information of narrow geographic scope, short timespan (3 to 5 years), and high occupational specificity; for professional curriculums, the interest is national and long term (10 to 20 years); for general training, the interest is in skill and discipline requirements of broad classes of occupations 5 to 10 years into the future.

There are strong constraints (pressure for immediate placement; pressure to meet past needs; importance of student interest and attitude determined by family, peers, and others; faculty inertia; lack of resources) limiting the ability of the educational or training institution to use such information.

As mentioned earlier, information about employment trends in municipalities over a 1- to 5-year period tends to be available from a variety of sources, and needs to be synthesized, interpreted, advertised, and centralized. There is a great deal of skepticism among knowledgeable people about our ability to make accurate longer term—roughly 5- to 20-year—forecasts of occupational demand at high levels of specificity either nationally or locally. Earlier efforts to do so have tended not to be successful. (See app. 1.) (This situation prevails with the exception of occupations very closely linked to demographic trends; e.g., teachers, nurses, doctors.) It is much more likely that we can make longer term forecasts of the skill and discipline requirements of broad classes of occupations.

Even if it were possible to make reliable, long-term forecasts of specific occupational demands, it is by no means obvious that such forecasts would be useful. There is first of all the question of their believability: Such forecasts tend not to be believed by those who might use them (especially when they must stand against pressures such as those described above), and therefore they tend to serve badly as a basis for action. Moreover, some of the same factors that tend to undermine the reliability of specific, long-term forecasts of occupational demand also make it questionable whether vocational training should attempt to adjust current curriculums to such forecasts: There is a frequent shift in the mix of occupational demand and in the skill content of specific occupations.

The emphasis on specific long-term forecasts represents only one strategy for coping with a shifting occupational future. Another is concentration on the development of flexible skills and attributes to orient vocational education to enable students to enter a variety of occupations and shift with maximum ease from one occupation to another. There is an inverse relation between the flexibility of training in this sense and the need for specific occupational forecast: The more narrow and rigid the training, the more it is dependent on accurate forecast of occupational demand; the more flexible the training, the less dependent. As a matter of fact, there is some indication that current vocational training tends to have at least some of its major value in providing the student with such flexible equipment, regardless of what its intention may be. It gives the student a "license" which says to future employers: "This student has made a deliberate, concentrated effort and received the approval of his instructors; he has been trustworthy; he has shown up day after day at 9 a.m., etc." It gives the student some confidence in his ability to take up unfamiliar tasks in unfamiliar situations.

Given these points and the questionableness of specific long-term occupational forecasts based on any methodology we now possess, it seems preferable to base curriculum development for vocational training on the strategy of flexibility, which would require only broad indications of occupational demand trends and broad indications of long-term skill and discipline requirements for clusters of occupations. These requirements for forecast information fit in well with what is now coming to be seen as desirable as a basis for the design of nonvocational curriculums.[1]

Such a strategy of flexibility may well imply not more frequent forecasts of occupational needs, but the development of new categories of training and education designed to provide students with broader access to occupations. The strategy represents one approach to an increasingly pressing question in training and education—the appropriate division of labor among vocational training, general education, and on-the-job learning.

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[1] Occupational forecasts such as *Occupation Outlook* may very well provide such broad trend information in spite of their stated orientation to specific long-term forecasts.

V. The Federal Government's Internal Concern With the Development and Use of Manpower

Apart from the concern of certain Federal agencies with the Nation's use and development of manpower, the Federal Government is concerned with its own use and development of manpower in the following ways:

> It wishes to assure adequate resources of trained manpower for its own short- and long-term needs;
>
> it is concerned with the dislocations of workers produced by shifts, including technological shifts, within agencies and among Federal contractors; and
>
> it is concerned, in a few cases, with the effects of its requirements on the Nation's supply of trained manpower.

In order to examine these matters, we interviewed a number of Federal agencies, including the Federal Aviation Agency, NASA, Department of Agriculture, AEC, and the Civil Service Commission.

We learned the following:

1. To varying degrees, Federal agencies now attempt to anticipate their own short-term requirements for trained manpower, their longer term needs for skills and disciplines, and the likely dislocations of employees due to shifts in activity, including shifts in technology. The disposition to undertake and act on this kind of analysis is to be found more frequently in more recently formed agencies such as NASA, FAA, and AEC. Such agencies, along with the Department of Defense, represent a "closed system" in the sense that they have considerable control over the introduction of new technology, the rate it is introduced at, and the training and retraining of men to fill these requirements. Their forecasts of need and shift tend to be accurate because, to a considerable extent, they are able to make them come true; and they have the resources to act on their analysis of resulting need. Older agencies such as the Departments of Commerce, Labor, and Agriculture tend not to represent closed systems in the same sense. However, there is a noticeable trend on the part of all agencies to take responsibility for analysis of their own manpower resources and requirements.

2. Agencies such as FAA, DOD, AEC, and NASA are in the best position, for reasons stated above, to do their own forecasting of manpower requirements and dislocations. However, they base these forecasts on current estimates of manpower resources, and current rates of change in these resources in their own fields. Most agencies interviewed expressed dissatisfaction with manpower information as it relates to their field in terms of specificity, currentness, and reliability.

3. Agencies such as DOD and NASA, which establish contracts large enough to matter to cities, States, and regions, recognize increasingly their responsibility to give advance warning of shifts in contract or in regional installations. The issue here again is one of local and regional agencies capable of acting on such information.

Shifts in the technology of warfare, which imply large-scale changes in contract with accompanying regional effects, are not so easily anticipated or even recognized as they occur as current shift in emphasis from massive new weapons system to tactical weaponry would seem to indicate. Forecasting such changes is, as we will see, part of the planning function of the military. The question whether such forecasts ought to be made available to regional industry, and if so at what stage, raises policy questions which lie outside the scope of this report.

4. There is also the problem of anticipating manpower requirements and manpower dislocations across agency lines. The Civil Service Commission has addressed itself to this task. The Commission completed in 1964 an analysis of the effects of automation on Federal manpower and manpower requirements, and completes each year a report on Federal work force requirements. Its data are drawn from agency statistics, agency projections, and agency budget reviews 3 years into the future. There is little evidence to date of the use made of these forecasts, of the need for them, or of the ability of the Federal Government to act on such Government-wide information, beyond what each agency does to anticipate and cope with its own dislocations and requirements.

5. NASA and DOD have both been concerned with the effects of their use of relatively scarce resources of manpower, particularly scientific and technical, on the Nation's future supply. NASA, for example, obtained from NSF's Office of Eco-

nomic and Manpower Studies forecasts of the effect of space programs on the Nation's employment of scientists and engineers; the Office used NASA's projected program requirements and its own projections of scientific and technical manpower availability.

It can be argued that as Government's share of the Nation's technical effort increases, Government agencies have responsibility for estimating the effects on the Nation of its own manpower requirements, particularly in the scientific and technical field. This, in turn, is related to the far broader question of the desirability of estimating manpower requirements, including scientific and technical, for the Nation's major goals, Federal and non-Federal, and comparing them with projected resources of trained manpower. The use of these estimates would conceivably be in permitting evaluation of the adequacy of educational programs (this relates to the teacher-training question discussed earlier) and in pointing to the need for evaluation of goals where these compete for manpower in resource-limited areas. Both the National Planning Association and Resources for the Future, Inc. (see app. 1) have attempted estimates of this kind. The technical manpower projections mentioned earlier approached the same issues from the resource side. This question will be discussed further in section VIII.

VI. Job Creation; Law and Policy Affecting Manpower

As far as the Federal Government is concerned, the creation of jobs occurs through four principal functions:

The making and implementation of policy affecting the economy overall (this will be discussed in the following section);

public works projects;

the use of Federal procurement, contracts, and regional installations to provide local jobs; and

job building through loans to business and through Federal-community action programs.

Government undertakes these programs through the Office of the President and the Congress—either of which may initiate them—and through various agencies, for example, the Area Redevelopment Administration, Bureau of Public Roads, and Small Business Administration.

Public works, loans, and Government procurement contracts, as means of providing jobs, are now generally applied after the fact to an area that is distressed. They are essentially first aid for employment, and their use is not currently associated with forecasts.

Federal community action programs designed to create jobs by stimulating local business have longer leadtimes associated with them, are more effective when undertaken before the fact, and could profitably be based on forecasts of local or regional employment dislocations. (See discussion of manpower adjustment above.) Contracts, loans, and public works might also be used effectively before the fact of regional distress as ways of building local and regional economies, if there are local or regional agencies capable of acting on the basis of such forecasts and incorporating such Federal aids into local and regional programs of economic development.

Law and Policy Affecting Manpower

Three kinds of law or policy affect the size and character of the Nation's manpower resource. They are:

(1) Law and policy affecting the flow of manpower into the Nation's resource. This includes State and Federal law and policy concerning immigration and child labor.

(2) Law and policy affecting the drain on the Nation's manpower resource. This includes military manpower policy and its policy toward other missions, such as exploration of space, that consume large amounts of manpower. It may also include law and policy concerning social security, unemployment insurance, retirement payments, and the like, which, it is argued, facilitate removal of workers from the labor force either permanently or for longer periods of time. Similarly, Federal and State policy toward support of education may delay or quicken the rate at which new workers enter the labor force.

(3) Law and policy affecting structural entry or mobility of the labor force. Federal and State policy toward discrimination, union policy toward apprenticeship regulations, Federal and State policy on the closed shop, union policy on featherbedding, company hiring policy, and the like, all affect the ease with which workers may enter and move in and out of segments of the economy, and therefore they condition the size and character of the Nation's manpower resource for those segments.

In each instance the law or policy has other objects—social goals, Federal missions, company, or union. Effect on aggregate or structural relation of manpower resource to demand is a byproduct. But since such law and policy are clearly an important influence on manpower, it may be argued that their effect should be considered in making occupational manpower forecasts; and the making of such law and policy, particularly by the Federal Government, should be based on forecasts of their contribution to future relations of manpower supply to occupational demand.

At present, the use of such forecasts in policymaking of this sort is informal and sporadic. Where a manpower crisis either exists or appears to be in the offing—as in the case of the braceros or the right-to-work laws—manpower effects are taken into account. Otherwise, the tendency is not to take them into account.

What is the character of the information required as a basis for such policymaking? It would consist of estimates of the effects of actual or proposed alternative laws or policies on the relation of manpower resource utilization to occupational demand for the Nation as a whole, as a rule, although in some instances it might affect only a

State or region; on a long-term (e.g., 10 to 20 years) basis, although there will be exceptions in which short-term effects are important; and in a way that is relatively general as regards category of training or occupation; as a rule it will concern categories as general as "men in the labor force" or "physical scientists," although in some cases it will be as specific as "railroad workers" or "agricultural laborers."

These requirements suggest the utility of a manpower supply-demand model for the U.S. economy which would allow manipulation of such nationwide, long-term general information. Such a model would allow policymakers to test the supply/demand consequences of alternatives in various fields of policy affecting manpower and test out specific law or policy alternatives for a variety of assumptions concerning other policies, total demand for manpower, and the like. Although the informal equivalent of such a model is available to policymakers on some occasions, it does not exist in any rigorous or systematic sense.

The utility of such a model for individual regions or States is highly likely in view of State and regional policy problems affecting manpower-supply/demand relations. Its utility for narrower categories of manpower training and occupation is not apparent and would need to be demonstrated.

Needless to say, any utility for such a model is contingent on the willingness of State and Federal agencies to use it.

In addition to law and policy specifically affecting the size and makeup of the manpower resource, there are questions of law and policy broadly related to the Nation's manpower program. Government has access to a number of instruments affecting the relation of manpower supply to occupational demand. These include overall economic policy, especially fiscal and monetary, as a way of creating demand for labor through economic growth; specific job-creating efforts; training and education support; support of manpower adjustment programs; and other policy and law (as discussed) affecting manpower supply and demand. At any given time, Government is confronted with the need to determine the total investment it is to make in the use of all these instruments and the particular strategy it is to adopt overtime in the mix of instruments used.

There are no clear guidelines for making such decisions. Nevertheless, the following factors are clearly relevant:

> The set of factors affecting rate of change in gross national product. These include what can be known about the affect of technology on GNP through productivity and new market creation. Ability to anticipate the effect of such factors influences judgment both about their proper use and about need to use them. Also relevant is knowledge about the effects of manipulation of these factors; for example, the inflationary tendency of fiscal and monetary policy aimed at stimulating growth in GNP. This is, of course, a major area of inquiry in its own right, but one that must be considered in the present context, as well as in many others;
>
> demographic factors;
>
> trends and rates of change in the character of training and education;
>
> trends in employment and unemployment; and
>
> factors affecting rates of change in national productivity.

Knowledge of current states of affairs, trends, and forecasts for all these factors are relevant to Federal decisions concerning use of instruments affecting manpower supply and demand. In addition, when any one instrument is being considered, it is relevant to consider the future effects of the others, extrapolated from current base, on manpower supply/demand relations.

Again, the scope of relevant information is national and the relevant timespan may vary from 6 months to 20 years or more.

The issue here is not the generation of specific forecasts but the development of decision tools which would allow assumptions to be made about the future state of factors other than those whose change is contemplated, and a testing out of the effect, given those assumptions, of changes in one set of factors.

Where an important policy change is contemplated, the effort can be made to confirm those assumptions and to forecast manpower supply/demand effects of the proposed change.

Such decision tools would constitute models similar to those described above. The rudiments of such a model are now available in the form of manpower data and projections, productivity trends, and projection trends in GNP, as well as broad national economic forecasts now attempted by organizations such as NPA and Resources for the Future, Inc.

VII. Summary of Findings

The activities discussed so far may be divided from the point of view of their actual or potential use of forecasts into four kinds:

1. Broad policy determination.
2. Primary education and training.
3. Adjustment to manpower dislocations.
4. Preparation for meeting anticipated manpower needs.

The use of forecasts in connection with these activities may be subject to two kinds of constraints: Constraints which impede the use of reliable information, and methodological weaknesses which prevent the development of reliable information.

Constraints

Regarding the first kind of constraint, we have noticed the following:

Information may not come to be used because of the lack of an appropriate active agency capable of using it; for example, the lack of local or regional groups capable of anticipating and averting manpower dislocations, or the lack of Federal agencies capable of controlling their introduction of new technology and the training of people associated with it.

Other interests, pressures, and attitudes may work against the use of forecasting; for example, the pressure for immediate placement of clients of employment services, vocational counseling, or vocational training; student or client attitudes toward work governed by factors other than occupational demand, such as occupational status as conveyed by family and peer groups; political pressures to give loans, contracts, or other aid to regions or localities independent of forecast information.

There is a strong tendency to respond to manpower problems and dislocations after the fact (for example, the disposition to wait until a regional or local crisis has occurred before acting) and to use instruments such as welfare payments, loans, relocation allowances, and the like, which may be used almost as effectively after the fact as before it. There is a corresponding resistance to establish action programs before a manpower crisis has arisen.

The characteristics of available forecast information, apart from its reliability, may make it difficult to use; for example, its fragmentation, its national character when regional or local information is wanted, and its lack of interpretation related to action.

There is a disposition to make manpower-related actions (such as teacher-training programs, curriculum choices, or enrollment) respond to past need, as advertised, regardless of present or projected future need. There is a corresponding tendency not to find forecast information believable and therefore not to act on it. This is particularly true where there are strong feelings about past need, where the forecast purports to be long term and highly specific, and where the forecast must fight against counteracting interests and pressures.

There is a running concern, particularly where the Federal Government is involved, with the self-fulfilling character of forecasts, which leads to resistance to the use of such forecasts. Paradoxically, this concern may run in two opposite directions. There is some evidence, for example, that industrial companies tend not to introduce technical change where its introduction is thought to lead to the dislocation of workers. This may be taken to represent a self-regulating system which makes technological forecasts for manpower reasons superfluous. There is also concern lest the Federal Government should make forecasts come true by announcing them, thus inducing companies and other agencies to proceed with the announced technical change "since it is coming anyway."

In addition to these factors, there are other aspects of the informal system for development and use of manpower which suggest obstacles to the present effective use of forecasts. These are precisely where the informal system falls short of being a formal one. While the Nation's manpower activities are generally directed at filling major needs and reducing unemployment, they are not clearly directed to a well-defined set of objectives. Not surprisingly, then, there are few clear measures of the effectiveness of the system's operation. It is difficult to establish, for example, the effectiveness of counseling and training programs in reducing unemployment. It is impossible to state how much unemployment they eliminate, and how bad the situation would have been were they not being undertaken. There is little feedback along the vertical chain of organizations concerned with one aspect or another of manpower problems. For example, institutions which support the training of guidance counselors tend not to know how effectively that money is spent; guidance-trainers tend not to know how effectively their students operate; counselors tend not to know what happens to the students they counsel. For all of these reasons, it is difficult or impossible to establish the extent to which the Nation's manpower activities are currently limited by lack of forecast information, to put an estimated value for the system on generating new forecast information, or to estimate afterwards what contribution that information has made to the system's effectiveness.

In the light of these constraining influences, it is important to distinguish between two contexts in which the use of forecasts could be discussed. The first assumes that the informal manpower system remains for the time being essentially as it is—improved, perhaps, but without radical change. In this context, we need to consider the usefulness of forecasts within the limits established by influences like those discussed above. The second context assumes a manpower system where such constraining influences are largely eliminated—in which, for example, there are measures of effectiveness, feedback from one station to the next, agencies capable of acting on advance information at the local and regional level, people who will believe reliable forecasts, and the like.

Because this report is concerned with forecasting and not primarily with the manpower system, we will not attempt here to begin a systems analysis of the Nation's manpower activities. Such an analysis would suggest the kinds of information that might become appropriate if certain constraints were removed. In any case, it is beyond the resources of this study. We will not assume an idealized manpower system as it might come to be sometime in the future. Instead, we will consider the informal manpower system essentially as it is.

Potentially Useful Kinds of Forecast Information

Given this system, the following kinds of forecast information appear to be useful:

1. Short-term (1 to 5 years, with emphasis on the early part of that range) specific forecasts of occupational demand as compared with trained manpower availability for particular municipalities.

Many sources of information of this kind are available. They need to be made centrally available at the local level, synthesized, interpreted in terms of implications for counseling, training, or job seeking, and well advertised.

Once such information is available, it may well be useful to extend it to include State and regional areas.

Local, short-term forecasts of this kind can profit from certain kinds of information, national in scope, which may be centrally generated; for example, the perceived skill and training requirements of specific occupations, information about shifts in Federal contracting or procurement policy which may affect particular localities, and information about technological diffusion which may affect the locality within the 5-year range. There is a need to determine more specifically the kinds of national information which will most effectively complement local, short-range forecasts of this kind.

2. More complete, reliable, and up-dated information than is now available concerning specific job openings for municipalities—and to an increasing extent, States and regions—coupled with descriptions of the skill and training requirements associated with those openings.

3. Forecasts of trends in employment and unemployment for municipalities and regions in the range of 1 to 10 years, especially large-scale dislocations of workers threatened by shifts in technology, market, or other factors.

Such forecasts can be at the level of broad industrial groupings; e.g., textiles or space electronics, with only enough specificity to pick up significant future employment effects on the locality.

Again, national information—relating, for example, to 1- to 10-year trends of growth in output and manpower for certain industries—could aid in making such local forecasts.

4. Long-term—10 to 20 years—national forecasts of demand for certain professionals; for example, teachers, doctors, and nurses. Such forecasts can be based to a large extent on demographic trends and projections.

5. National (5 to 10 years) forecasts of skill and discipline requirements for broad classes of occupations; for example, engineering technicians, physical scientists, or business clerical help.

6. Long-term (10 to 20 years) national forecasts of demand for broad categories of scientific and technical people.

7. A model of the Nation's manpower system capable of being manipulated to show the effects of policy changes 1 to 20 years into the future at broad levels of occupational and training categories, including such factors as output, productivity, trends in education and training, employment and unemployment, and demographic trends.

Such a model would not constitute a forecast or series of forecasts, but would permit manipulation to show the effect of policies on the manpower supply-demand relations, given varying assumptions about future states of factors such as those listed above.

All of these kinds of forecast information would, if they were available, have a reasonable chance of being useful in the manpower system essentially as it is. Some—notably 1 and 2—would be more obviously useful than others.

Taking these seven kinds of potentially useful forecast information as a guide, the objectives of a

Federal effort in forecasting for use in our present informal manpower system would be:

> To improve the effectiveness of local, short-term manpower-adjustment efforts.
>
> To provide notice 1 to 10 years in advance of regional manpower dislocations by broad occupational and industrial categories.
>
> To provide broad occupational guidelines for curriculum development 5 to 10 years in advance.
>
> To develop models of the Nation's manpower system for use in formulating Federal manpower-related policies.

All of these potential uses of forecast information are outlined in Chart 3.

Relation to Methodology

Our earlier discussions strongly suggest that given the manpower system essentially as it is, it is not useful to generate long-term (10 to 20 years) forecasts of specific occupational demand. As a general rule, forecast information that the system is likely to be able to use will tend to become more general as it extends into the future.

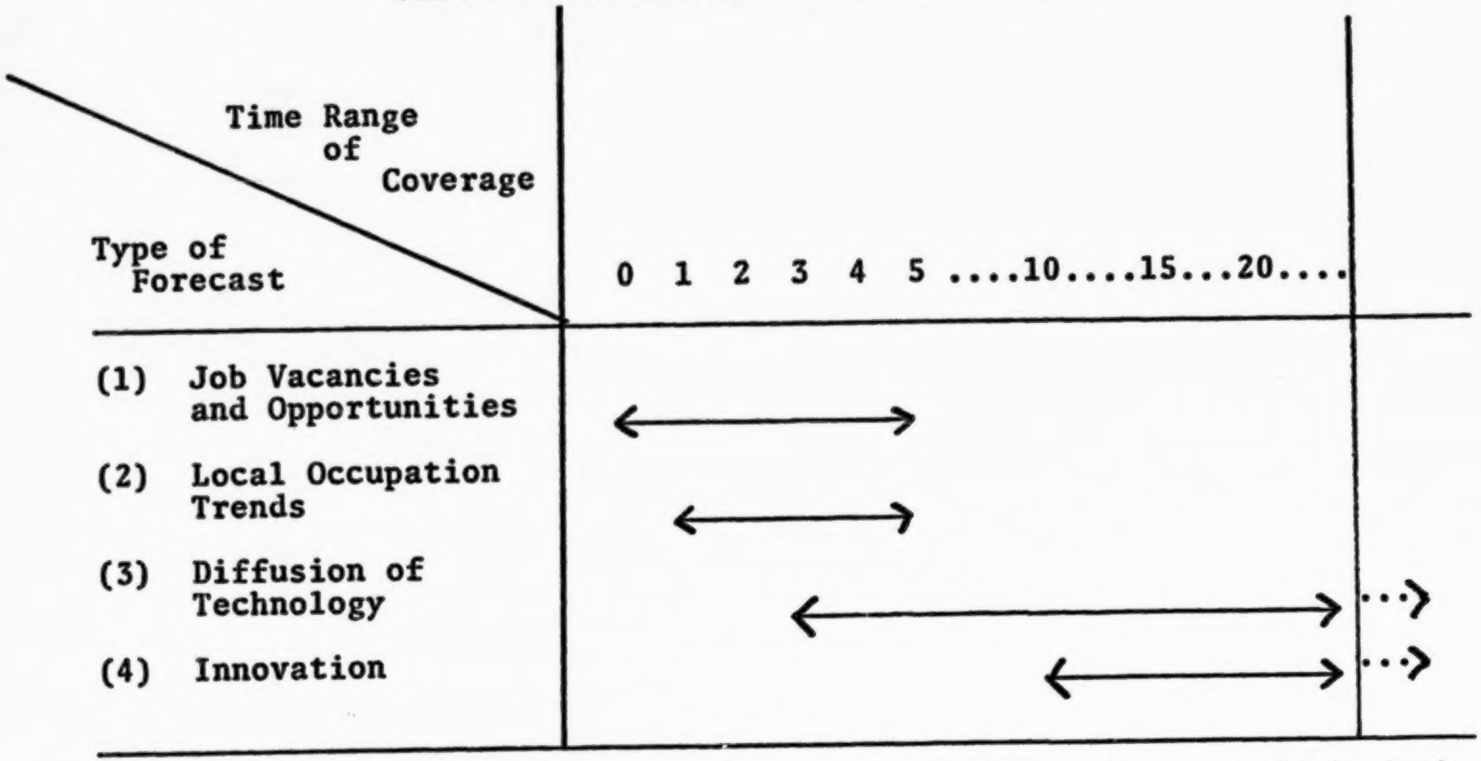
This tendency corresponds to similar methodological limitations. Long-term forecasts lose in credibility as they gain specificity.

Nearly all of the requirements for forecast information listed above pertain to a range of 1 to 10 years. When we relate this timespan to the kind of technological forecasting involved, we find, in effect, that technological change, as opposed to other determinants of manpower demand, does not begin to be a significant influence until after about 3 years. (See chart 4.) The diffusion of existing technology begins to be important at 3 years, depending on ease of introduction of the technology,

CHART 3. USES OF FORECAST INFORMATION

Activity	Forecast information now used	Constraints on use	Characteristics of usable information
A. Broad policymaking:			
1. Economic	Current data, trends, and projects for: GNP; productivity; employment and unemployment; education and training.	Objectives other than manpower policy.	Models of manpower supply/demand relations: National; short and long term; general, for categories of manpower and occupation.
2. Affecting manpower resources.		Special interests: Regional, labor, industrial.	Permitting testing of policy alternatives for various assumptions about factors governing manpower supply/demand relations. Factors include: Productivity; output; demographic factors; education and training; employment, unemployment; rate of change in GNP.
3. Broad manpower policy.			
B. Primary education and training:			
1. Teacher-training facility support.	Student-teacher ratios for various disciplines and demographic trends.	Disbelief in information: Student, institutional interests.	Possibly long-term (10 to 20 years) national forecasts of needs for broad categories of scientific and technical people.
2. Curriculum design and development.	For vocational curriculums: Information from many sources, including uses on State and regional employment trends; 1- to 5-year projections of these trends; advisory committees from business and labor. For professional curriculums: Advisory committee inputs; demographic trends and forecasts.	Pressures for immediate placement of graduates: Inertia of facility; pressure of student attitude and interest determined by family, peer groups; lack of interpretability of information; pressures to meet past needs.	Centralized, synthesized, well-advertized, interpreted short-term (1 to 3 years) forecasts of occupational demand by specific category for municipalities, increasingly for State and region need for national base, trend, and forecast information as a basis for regional and local short-term forecasts; short-term, specific forecasts of needs for professionals related to demographic trends.
	For general curriculums: Information concerning qualification for later training requirements.		Skills and discipline requirements for broad classifications of occupations, manpower, 5 to 10 years into future.
C. Manpower adjustment:			
1. Guidance, retraining employment.	Short-range employment trends for municipalities by specific occupation: Limited availability; job openings.	Student interest and activities determined by factors other than employment. Pressures for immediate placement (especially in employment services, vocational studies). Lack of interpretability synthesis of available information. Pressures of other kinds of guidance.	Local, short-term (1 to 5 years) projects of specific employment trends, increasingly extended to regions synthesized, interpreted, central availability. Local job openings: More reliable, complete.
2. Local and regional economic development.	Limited: Regional, local employment trends.	Lack of action agencies.	1- to 10-year forecasts of employment trends for localities, regions, especially dislocation threatened by technological, market, other economic shifts.
D. Preparatory for meeting manpower needs:			
1. Companies	Immediate program requirements. Much less: 5- to 10-year program requirements.	Forecast requirements tend to be used and useful when agency constitutes "closed system" controlling introduction of change, training of manpower resource; not otherwise.	
2. Federal agencies	Short, long-term requirements		
3. National goals			Possibility of long-term requirements (10 to 20 years) for scarce manpower resources, especially scientific and technical.

Chart 4. Time Range of Coverage by Type of Forecast



and may continue in importance for 20 years or more. Innovation—the commercialization of an existing development not yet introduced into commerce—does not generally begin to be important until after 10 years.

Accordingly, within the timespan of 1 to 10 years, the main relevant form of technological forecasting for the requirements of the manpower system essentially as the requirements are, is the forecasting of technological diffusion; i.e., the rate and direction of the spread of technology already in commercial use.

Technological change is only one component of the seven kinds of forecasting outlined above, and in no case can it be said to be the dominant component. In the case of short-term local forecasts of occupational demand and job openings, it must take a back seat to market shifts, changes in Government contracts, plant expansion or contraction, and the like. (Although these other factors may reflect technological change, forecasting them on a short-term basis does not proceed more effectively by consideration of technological change.)

Is it methodologically feasible to undertake the seven kinds of forecasts described above? Our consideration of past and ongoing efforts at technology-related forecasting prompts the following:

(1) The evidence suggests that local 1- to 5-year forecasts of occupational demand and manpower availability are feasible and, in many instances, are actually in existence, though in a form that makes their use difficult.

(2) Better information about current job openings on a municipal or regional basis depends on corporate willingness to furnish such information and on the existence of a more effective institutional framework for using it.

(3) Forecasts of trends in employment and unemployment for municipalities and regions in the 1- to 10-year range have been undertaken, e.g., the (Chicago) CORPLAN Study. Some of them appear to be useful, although there has been little effort to date to establish their validity.

(4) Where national demand for professionals is closely tied to demographic factors, 10- to 20-year forecasts are more feasible than any other form of long-term specific forecasts of occupational demand. They are nevertheless subject to unforeseen changes in the character of the professions themselves which would change current ratios of professionals to total population.

(5) There is little, if any, evidence of successful attempts to forecast actual 5- to 10-year requirements for skill in broad classes of occupations. Even the language for describing such skill clusters is at an early stage of development. Nevertheless, it is likely that such forecasts would be more feasible than highly specific occupational forecasts for the same time period.

(6) Efforts at forecasts of the demand for science and technical manpower over long periods of time have tended to be significantly in error, even in the short term. There is also some evidence that forecasts of this type tend to have unfortunate self-defeating effects when made public.

(7) Models of the Nation's manpower system have been attempted, to our knowledge, only on a pilot basis. Their feasibility as decision tools—not as forecasts—may be inferred from the analogous use of system models in other fields.

VIII. Recommendations

The recommendations made here are short term, covering the next few years, and assume the informal manpower system to remain essentially as it is. However, the constraints on effective use of information in the system, as listed above, should also be studied for possible change. Specifically, we recommend:

1. A full-scale analysis of the manpower system should be undertaken which takes into account informal as well as formal aspects of the system, constraints on the use of forecast information in the system, clearly defined objectives for the system (or description of the form the system would take for different assumptions about objectives), measures of accomplishment, feedback between segments, and the usefulness of forecast information in a manpower system that operated more effectively in these respects.

Such an analysis would permit evaluation of the utility of models of the Nation's manpower system as a way of exploring, before the fact, alternative Federal policies related to manpower. Such models would not produce forecasts, but would highlight the forecast questions on which policy decisions critically depend. They would provide a basis for determining which forecast questions are worth expenditures of money, energy, and time.

We have already identified kinds of forecast information worth getting, given the manpower system is essentially as it is, and the adequacy of existing methodology to these requirements. Our further recommendations are concerned with actions that ought to be taken to secure this information and see to its use, and the level of the system at which the generating of this information could be most effectively done.

2. For the support of local manpower adjustment activities, the Nation's current sources of short-term forecasts of occupational demand and manpower availability should be assembled in each municipality and processed in the following way:

> Synthesized so as to form a single coherent picture of short-term occupational demand as compared with future manpower availability for each community;
>
> coupled with perceived skill and training requirement of their occupations;
>
> made interpretable for use in local guidance and national programs;
>
> regularly up-dated;
>
> well advertised; and
>
> made readily available to local guidance counselors and vocational trainers, public and private employment service people, and other manpower adjustment mediators.

Input sources should include employers, civic groups, banks, educational and research institutions, and publications (area skill surveys and training need surveys) of local U.S. Employment Offices. A scheme for such a center is presented in chart 5.

The operation of these centers should be coupled with local businesses and labor unions, and should rely on them for advice, information, and possibly financial support. If these centers are to be effective, there must be extensive cooperation with local business. Local business must be able to foresee benefits from such cooperation—for example, in reducing time and/or dollars spent in training, or adjustment to dislocations.

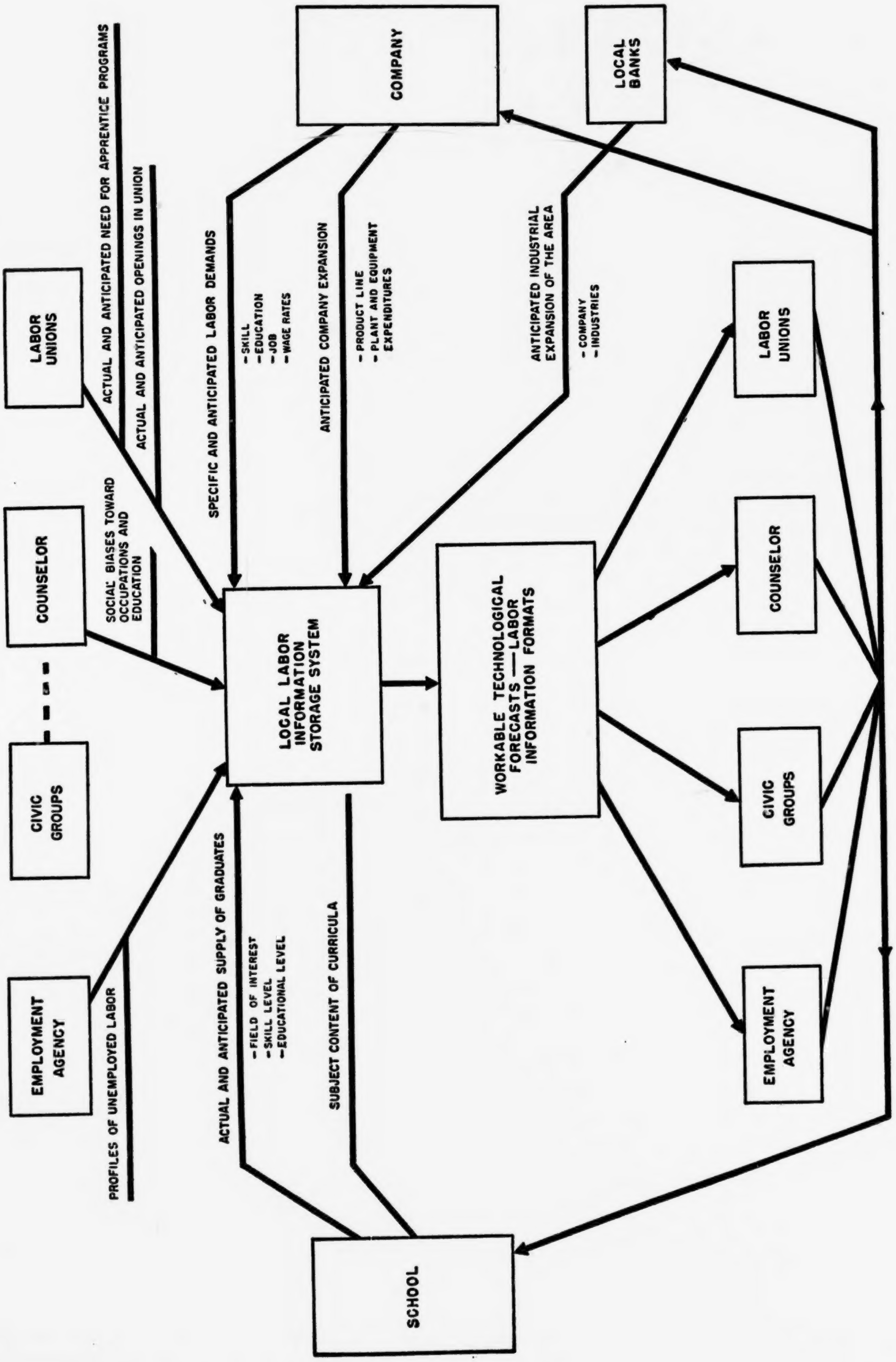
A further benefit of local business involvement could be the receipt of regularly up-dated information about specific job openings now unavailable for one reason or another to U.S. Employment Services offices.

As a second step, such local information centers could usefully expand to establish regional information centers concerned with regional occupational demand and manpower mobility in the 0- to 5-year range. Such centers would service regional manpower adjustment efforts, including vocational training, counseling, and employment service functions.

The present report will make no recommendation as to the organizational location of such municipal or regional information centers. However, following are kinds of alternatives: Location in existing U.S. Employment Service offices, location in new Federal Government-related offices at the local level, and location in private agencies, for example, civic or industrial labor groups or some new combinations of them, with information inputs from existing State and Federal Government agencies.

3. Regional and municipal efforts should be undertaken, where they do not now exist, aimed at forecasting 1- to 10-year trends in occupational demand and manpower availability, with emphasis

CHART 5. SCHEMA FOR A POSSIBLE LOCAL FORECAST INFORMATION CENTER


EMPLOYMENT AGENCY
CIVIC GROUPS
COUNSELOR
LABOR UNIONS
PROFILES OF UNEMPLOYED LABOR
SOCIAL BIASES TOWARD OCCUPATIONS AND EDUCATION
ACTUAL AND ANTICIPATED NEED FOR APPRENTICE PROGRAMS
ACTUAL AND ANTICIPATED OPENINGS IN UNION
SPECIFIC AND ANTICIPATED LABOR DEMANDS
- SKILL
- EDUCATION
- JOB
- WAGE RATES
ANTICIPATED COMPANY EXPANSION
- PRODUCT LINE
- PLANT AND EQUIPMENT EXPENDITURES
ANTICIPATED INDUSTRIAL EXPANSION OF THE AREA
- COMPANY
- INDUSTRIES
COMPANY
LOCAL BANKS
LOCAL LABOR INFORMATION STORAGE SYSTEM
WORKABLE TECHNOLOGICAL FORECASTS — LABOR INFORMATION FORMATS
ACTUAL AND ANTICIPATED SUPPLY OF GRADUATES
- FIELD OF INTEREST
- SKILL LEVEL
- EDUCATIONAL LEVEL
SUBJECT CONTENT OF CURRICULA
SCHOOL
LABOR UNIONS
COUNSELOR
CIVIC GROUPS
EMPLOYMENT AGENCY

on possible future dislocations of manpower resulting from market, technological, or other shifts.

Such efforts should be associated with municipal and regional groups prepared to act on information of this sort. Candidates include mayor's or governor's councils on economic development, State or regional delegated agencies for the State Technical Services Act, and municipal or regional information centers such as those suggested in 2 above.

4. Certain kinds of information national in scope and centrally generated should be made available. Regional and municipal forecasting efforts of the kinds described above would profit from such information, generated by a single agency of Government in close contact with local forecasting efforts and tailored to fit local needs. Examples of relevant information are perceived skill and training requirements for specific occupational categories in the 1- to 5-year range; and trends in the 1- to 10-year range for broad industrial categories (e.g., textiles, space industries) in such areas as total market as affected by customer demand, imports and competition from other industries, industry production plans, productivity, significant changes in technology and skill changes associated with them, demographic trends as related to manpower and trends in education and training and manpower mobility, Federal policy changes likely to affect local industry and the direction of their effect, e.g., export-import, subsidies, and loan policy, and change in Federal purchasing policy.

Such a central information resource could also usefully be addressed to the problem of generating 1- to 10-year national forecasts of skill requirements for clusters of occupations as an aid to the development and design of vocational and general curriculums. Its concern here would be with the diffusion of technology cutting across industrial lines and the skill requirements associated with this technology. In order to be effective, the resource would have to be coupled with those engaged in the design of curriculums at Federal, State school board, and individual school levels.

This agency should be concerned with all factors relevant to items such as those suggested above, not merely the technological. It should define its task in a continuing fashion, on the basis of its contacts with local and regional agencies concerned with the short-term local and regional forecasts for manpower adjustment purposes and with the design of vocational and general curriculums.

The agency should be concerned, as well, with the support of continuing work on methodology for technology-related forecasts. In this sense, it would meet the need for an organization concerned with the development, testing, and demonstration of technology-related planning and forecasting methodology. As a step in this direction, it should devote considerable effort toward assessing the validity and usefulness of technology-related forecasts which have been and are now being made. The absence of such an effort helps to account for the field's current disarray.

Appendixes

APPENDIX 1

Methodology

This section will discuss some of the approaches which have been taken or are being proposed to predict technological change, or to predict some other variables conceived as partial functions of technological change. Although technology is rarely the main subject of a forecast, in most forecasts technological considerations nevertheless play an important part. This is true of manpower and occupational forecasts, and is more important the longer the period being forecast. It is also true of forecasting of industrial growth, overall and by industry, or for a corporation. It is certainly an important part of the special studies made prior to the planning of Federal investment in water resources, transportation, or power; of studies involving the prediction of resource utilization; of research and development planning, whether public or private; of politicoeconomic studies which attempt to cost the achievement of stated political objectives; and of social studies of the future impact of technological change.

We will discuss illustrations of each of these types of technology-related forecasts from the points of view of the methods used in the forecast and the uses to which it is put. Then will follow a discussion of some of the methods for forecasting technological change being evolved or which might be evolved from some of the theoretical studies of the subject.

Technology-Related Forecasts

Among the many forecasts of technological change being made implicitly or explicitly throughout the economy, some are simple assertions, informed estimates, or "guesstimates" of, for instance, the state of technological development in a particular field at some date in the future. Others are not, strictly considered, forecasts at all. They are termed projections. A projection is a conditional statement about some limited aspect of the future; it says that something will happen only if other conditions also hold true. Thus the simplest projections, extrapolations of past trends, are based upon the condition that the relevant factors at work in the past will continue unchanged in the future.

For some purposes, such as short-term forecasts about stable systems, such extrapolations of trends may be adequate. But where the system oscillates irregularly, as the economic system does, or where radically new factors like technology may come into being, straight extrapolation is inadequate. In such cases forecasting tends to depend on a number of different projections based on different sets of conditions. Economic projections may each be based on a different assumption concerning the rate of growth in gross national product. Military projections may be based on different assumed levels of development expenditures, of research man-years allocated, and of technological breakthroughs achieved. Characteristically, the forecaster will use a basic extrapolation of trends (such as rate of growth in GNP) and proceed to modify that extrapolation by other considerations.

In most cases, those making projections do not put great faith in their accuracy. Arguments for making such forecasts or projections are more usually based, as we have already observed, on the fact that decisions have to be made now about programs and policies to operate in the future, and that, like it or not, such decisions will depend on assumptions about the future.

It is still surprising, however, given the efforts going into forecasting in most sectors of the economy, how little attention is being given to examining the quality of the product after the event. This may have not a little to do with the difficulties of validation.

First, projections may be well related to reasonable assumptions or original conditions. If the original conditions are not fulfilled, the forecast has not been validated, but neither has it been shown to be false.

Second, forecasts are not made in a vacuum, but usually for a purpose. Imparting the contents of the forecast to administrators or to the general public may have consequences on decisions or behavior of either group. Some forecasts have a self-fulfilling tendency and some the converse. The self-fulfilling characteristic applies particularly to the forecasting of technology. If the forecast indicates that some particular line of development in a field holds the greatest scientific promise and the prospect of economic feasibility, those administering the program may allocate most of their funds for technical development in that particular line. This allocation of resources itself may make technical advances in that direction more likely. The forecast may fit the subsequent facts, but the question arises whether alternative lines might have proved equally promising if they, too, had been the recipients of development funds.

The converse, or self-falsifying, result can be achieved by a forecast. If, for example, the published results of a forecasting study indicate that there will be no shortage of scientists and engineers in a certain number of years, there may be a reduction in number of applicants for places in those fields in universities. The reaction to the forecast takes place at the margin. In some respects forecasts are not like statements of fact, but more like expressions of fear, or hope, or promise of the future. Some performatives can be judged reasonable or otherwise, but not true or false.

Whatever the obstacles to validation, it is fair to say that information about the validity of technology-related forecasts is almost wholly lacking.

From the partial list of attempts at technological forecasting (1) for manpower purposes, (2) for industrial growth studies, (3) for investment planning, (4) for prediction of resource utilization, (5) for research and development planning, and (6) for politicoeconomic and social studies, we begin, in view of the task group's primary focus, with forecasting of technological change in connection with manpower forecasting.

1. *Manpower.* Manpower forecasting, at one extreme, covers comprehensive national projections of supply of and demand for different groups of workers by industry or occupation. At the other extreme it covers projection of demand for labor of a specific occupational group or groups such as might be made, for example, in a local labor market by a corporation for its own manpower requirements. In some instances, supply and demand are projected separately in order to indicate likely excess or shortage of workers; in others, the projected supply is taken as indicated by extrapolated recent trends in actual employment figures. Sometimes supply is not separately estimated, as if by some process future demand will bring forth the appropriate supply.

The Bureau of Labor Statistics of the Department of Labor carries out major manpower forecasting activtiy. The results of this work, in terms of specific statements as to whether employment opportunities in hundreds of occupations will shrink, increase, or remain constant in the future, are embodied in the *Occupational Outlook Handbook*,[1] which is periodically revised.

The basic framework on which these occupational projections rest is described in two other Department of Labor publications, the *Occupation/Industry Matrix*, and more recently, *The Forecasting of Manpower Requirements*. Population projections of the Bureau of the Census together with assumptions concerning the level of economic activity are used to indicate the general level of demand for goods and services. This demand must be transformed into demand for the product of specific industry groups.

The demand for labor in particular occupations is derived from this demand for goods and services, but the derivation is tempered by a number of factors. The age distribution of workers in a particular occupation may be such that the natural attrition rate due to retirement is high even though the demand for that particular occupation is not increasing. This may be because increasing demand leads to a more efficient scale of operation, because the efficient firms are expanding and the inefficient ones are contracting, or because technological changes taking place in the industry result in the derived demand for labor being less directly related to the product demand.

These are some of the factors which have to be given numerical form in projecting the demand for labor. In part they are based on current trends, and in part the trends are modified by new factors and by the constraint of the size of the labor force.

The supply of labor to different occupations similarly is based on population trends and trends in the present supply, or on the labor participation rates together with new factors, such as the increase in average education of the young compared with their parents and the availability of new training facilities. The matching of these supply and demand estimates indicates projected shortages of jobs or people and leads hence to statements of rapid growth in opportunities in this or that particular occupation.

In general the methods which have been developed ad hoc for manpower forecasting are common to a number of other forecasts, too, with appropriate changes in the relevant economic statistical series collected and analyzed. For each occupation an estimate of future demand for the products of various industries in which the occupation is used is taken from major national income and sectoral estimates. Within this level of product demand a number of factors may affect the demand for particular types of labor. These might include changes in hours of work and projected productivity trends where these are available—in other words, changes in output per man-hour that arise from technological changes and other causes. The methods may be summarized by saying that first, the overall manpower trends are examined; then, as many components as possible of supply and of demand are examined separately; then, changes in these components are discovered and used as modifiers of the general trend.

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[1] For full citation of all references, see bibliography, app. 2.

In a Department of Labor paper entitled "An Evaluation of Experience in Long-Term Projections of Employment by Occupation," the accuracy of the explicit or implicit projections made in the 1949 edition of the *Handbook* was evaluated by comparing these projections with actual employment changes shown by the decennial censuses of 1950 and 1960. The evaluation stated:

> This first attempt in the 1949 *Occupational Outlook* was particularly successful in identifying declining industries and occupations. As an early warning system of the effect of economic change upon employment, it turned in a creditable performance.
>
> It was successful in about three out of four cases in projecting the general direction and magnitude of all changes in employment—both increases and decreases.
>
> Thus, both in pointing to growing fields as well as in warning about declining ones, it made a contribution to the allocation of manpower in line with changing employment opportunity.

The individual occupational forecasts contained within this overall manpower study are amended from time to time by separate studies of the occupations. Indeed, some particular occupational groups, such as scientific and technical workers, have been the subject of a number of intensive forecasting studies both within the Federal Government and by other institutions.

The same general approach described above was again used by the Bureau of Labor Statistics in its study for the National Science Foundation, *The Long-Range Demand for Scientific and Technical Personnel—A Methodological Study*, and in subsequent work of the BLS. The segments of the market in this case were each sector of private industry, the different levels of Government, and the various types of educational institutions. Projections of employment in each segment of the economy were then translated, by trends in the ratios of scientific to total employment, into projections of demand for scientific personnel.

Another Department of Labor study, while not a forecast, provides the kind of detailed study of a market necessary for the preparation of forecasts. This is the Bureau of Employment Security's semiannual report, *Current Labor Market Conditions in Engineering, Scientific, and Technical Occupations*, principally based on the biweekly information received from State employment agencies concerning inventories of vacancies not filled locally. The National Industrial Conference Board, too, has begun an investigation of vacancies as a measure of the expressed but unfilled demand for different kinds of labor in a series of case studies.

It has been argued that leaning upon the analysis of past trends, as the forecasts described above tend to do, makes the forecast least useful when most needed. When a change in the trend occurs, the forecast based on trend analysis will, it is claimed, fail to pick up the change.

One alternative attempt at forecasting which has tried to avoid reliance on past trends has consisted in surveying employers to ask them their future intentions. The Engineers Joint Council has conducted such a survey at about 2-year intervals, at the same time seeking information on recruitment of engineers, scientists, and technicians in the previous and current years. Thus in subsequent surveys intentions can be compared with actual recruitment. For any period longer than 2 years only a small proportion of employers, it appears, make any kind of projection of future requirements. Of those who do, a substantial number seem merely to extrapolate from trends in their own firm's recent past, and hence experience the same difficulty in anticipating change.

A number of corporations are giving thought to the problems of planning and of anticipating their own future manpower requirements. The American Management Association sponsored a course, manpower planning, in September 1964 which was directed toward corporate personnel officials and conducted by personnel managers from corporations which have been working on their manpower inventories for some time.

If forecasting by means of straight extrapolation of past trends, however sophisticated the segmentation of those trends, carries with it the danger of not foreseeing the rapid onset of deviation from the trend, potential causes of change have to be explored. These include changes in taste, such as the shift with affluence first toward the purchase by consumers of more durable goods and then to more personal services; the change in the structure of industry leading to more production by efficient firms and less by the inefficient firms—one of the prime reasons for increasing productivity—which takes place without any radical departure from current methods of production; the shift to a larger scale of output made possible by growth in population and in affluence; changes in methods of production and organization, sometimes accompanying larger scale, certainly stimulated by it, but sometimes occurring independently; and the development of new products, processes, and services by a dynamic economy.

2. *Technological Forecasting by Industry.* Change in labor market requirements due to new methods of production or to new products were the subject of a BLS study, *Technological Trends in 36 Major American Industries*. This is one of the few to make anticipated technological change

its prime subject matter and for a wide segment of industry.

The authors proceeded by reading the relevant trade and technical journals, reports by Government agencies, and annual reports of companies. They prepared a statement for each industry studied concerning those "machines, processes, and products" believed likely to have an "important effect on the industry's unit labor requirements over the next 10 years." They did not concern themselves with the inventions and discoveries which were still being made, nor with those only technically feasible. They studied those "innovations in an early stage of commercial usage" but not yet widely adopted; in other words, they studied those innovations which appeared likely to be diffused through the economy in the future. The statements were submitted to about 150 experts in trade associations and unions, companies, and Government. Results were presented in the form of charts showing trends in employment, output, output per man-hour, and expenditure on new plant and equipment.

This approach assumes that the study of employment, output, and labor productivity trends can be meshed with the examination of particular technological developments within sectors of the industries studied. The results, qualitative statements usually without reference to any timespan, depend upon a large number of judgments. These include the selection of innovations feasible in the marketplace, judgments as to speed or spread of innovations through industry, and the implications which each innovation will have, together with the market demand for the product of the industry, on the outlook for employment.

As with manpower forecasting studies, much of the interest in the subject of technological change by industry is concerned with the local market. A study group of Corplan Associates of the Illinois Institute of Technology has met this interest by carrying out a series of studies of particular industries in the Metropolitan Chicago area. The purpose was "to provide social, economic, and city planning groups with yardsticks to measure these impending" technological developments.

Interviews in each of the industries covered were conducted. Published reports and studies were read. Several alternative projections were made of which the most likely was given in the report. The implications of this technological projection were then discussed. An example illustrates the method and the kind of assumption made.

> **The Midwest consumed 37 percent of total national steel production, but produced only 30 percent of this. Consideration of freight rates, with narrower profit margins, leads to the conclusion that the local suppliers can increase their share of the national market by the percentage.**

3. *Industrial Studies.* Detailed technological forecasts for narrowly defined sections of industry have been undertaken by such consulting firms as the Battelle Memorial Institute and by the Long Range Planning Service of the Stanford Research Institute. The Stanford group has even prepared what might be termed a metaforecast, a forecast of techniques and approaches likely to be in wide use by 1970 for planning purposes. Here again the methods used for the forecast combine interviews with the technically informed, study of all relevant documents and reports, and economic judgment as to commercial feasibility.

An example of one such study is that of air cargo by the Stanford Research Institute. It examines reasons why rates may fall, why the market will expand fivefold, which particular segments of the market may increase more, and why the air cargo proportion of total domestic freight shipments may be expected still to remain at less than 1 percent by 1975 in spite of improved handling capability.

McGraw-Hill's *The American Economy, Prospects for Growth Through 1975* represents a broader forecast of economic growth in which technological factors are one group among several affecting industrial growth. Here, a forecast of GNP is taken from trends in officially published figures. Then trends in industrial production in major industries are examined, together with trends in population, labor force, investment, research and development, and other series. These studies are supplemented by a survey of larger firms in each industry and of technical journal editors. Judgment is required in choosing the past time period on which to base the trend analysis for the future.

Planners in individual corporations tend to use a forecast of GNP and industrial growth such as McGraw-Hill's, into which they fit their estimate of their own company's growth. There are more than 300 corporations which engage in technical planning and forecasting where technological forecasts play a part. In addition, most large firms and many small ones carry out marketing studies and forecasts that involve at least implicit technological forecasts.

4. *Federal Investment Planning Studies.* As with industrial corporations, the Federal Government's need to make investment decisions with long timespans and high costs has forced it to spell out and estimate the probability of major technological alternatives in a variety of fields.

Supersonic Transport. In this venture, agreement about requirements was not automatic. Neither was opinion on the proportion of development costs which should be borne by the Government, nor whether, indeed, a supersonic aircraft should be built in the U.S. A Federal task group set up to look into the question considered costs and advantages of various types of possible supersonic aircraft, the project's interaction with other parts of the economy, effects on national prestige, and the balance of payments. Here, forecasting consisted in trying to foresee the likely alternative technical routes as a way of determining the particular route to be followed.

The committee interested Government agencies, the aircraft industry, and airlines in developing their goals for technical performance and cost. It made recommendations on technical performance and on the allocation of costs between public and private interests, including estimates of the cost of changing or adding to the program. It initiated a number of technical investigations such as new tests of strengths of metals and the effects of sonic boom.

Basically, the task group narrowed the alternatives down to three or four airplanes which it believed to represent the most technically and economically feasible alternatives. It estimated the seriousness of the technological problems associated with each, and developed for each an estimate of costs of development, capital investment, and maintenance. These it compared to projected income based on estimated transportation demand for each airplane. Its product was a benefit-cost analysis concentrating on return on investment.

Basic Scientific Research. The House of Representatives Committee on Science and Astronautics asked the National Academy of Sciences in 1964 to conduct studies on desirable patterns and levels of support for basic research. The Academy, in turn, invited papers on the subject from 15 scholars who were given freedom to treat whatever aspects of the subject however they wished.

As a result of these independent approaches, a few shared conclusions can be summarized. A ratio of 10 to 15 percent of the amount going to applied effort should be given to basic research. The group felt that the amount was limited by the possibilities of producing more Ph. D.'s in basic subjects. Support for biological and environmental studies should be enlarged, perhaps with a diversion into these fields of some physical scientists. The physical sciences themselves, it was suggested, should expand to a greater extent outside the mission-oriented agencies, and more under the auspices of such bodies as, for example, the National Science Foundation.

This example of selection of a prestigious group to consider a problem concerning future scientific and technological events is less easily considered forecasting. But the group of scientists was attempting to foresee the likely future course of scientific events and allocate resources in the most promising way.

A similar approach to this research "forecasting" has been used for particular academic fields. The National Science Foundation asked the policy committee of the National Academy of Sciences to review oceanography, ground-based astronomy, atmospheric sciences, and high energy physics. The review involves looking for a method of deciding, on the basis of some set of reasonable assumptions, what should be the level of activity in the subject and what should be the general outline of the research program for the next 10 years. Usually the review rules out the general economic and invidious question of considering one field against another.

The Northeast Transportation Corridor. In the early 1960's the increase in population density and the density of traffic in the northeast Boston-to-Washington corridor area raised concern and led to the suggestion that a Government-wide project be initiated. The aim of the project was to determine what, if anything, the Federal Government could do to help the healthy growth of all modes of transport in the corridor. The sum of $90 million was authorized for the project over a period of 3 years.

On one level, the project considered the economy of improved regular transportation systems. This involved investigation of ways that advanced technology might be used to modify and improve present service, for instance, improving the existing railroad bed so that trains can run at 150 miles per hour.

On a second level, the project considered different types of possible transportation systems and asked what the optimum mix may be in the next 15 and 25 years. How is the demand for transportation best divided among the various types of system?

Tests of the economic feasibility of some of the more radical technological possibilities is extremely expensive. As a result new methods are being developed for the intermodal study. These include the use of simulation techniques to calculate costs and revenues and traffic patterns. They also include an integrated study of a wider range of factors, such as those affecting the economic development of the region.

The principal methods for this study consist of technical analyses of types of roadway, vehicle, and high-speed ground propulsion systems taken first singly and then in combinations. Consideration of cost and technical feasibility bring the major alternative vehicle-roadway-propulsion systems down to five or six.

Each is then evaluated in terms of its ability to cope with the size and kind of estimated transportation demand in the corridor, its promise of return on investment, and its effect on the regional economy.

Many analogous studies of technology-related investment decisions have been and are being undertaken by the Federal Government in areas such as energy, water resources, water desalinization, pollution control, and the like.

In each instance, the effort is made with more or less success to estimate major alternatives for investment, major technology-related factors, and the benefits and costs of alternative decisions. In general, technological forecasts and estimates are made in other studies out of the careful but indirect judgments of experts in relevant fields. More explicit quantitative methods may then be used to estimate the economic effect on values of one or another technological alternatives.

5. *Projection of Resource Utilization.* A major study emanating from Resources for the Future, Inc., entitled *Resources in America's Future, Patterns of Requirements and Availabilities, 1960–2000*, was addressed to this important question: "Can the United States over the balance of the 20th century count on enough natural resource supplies to sustain a rate of economic growth sufficient for . . . the attainment . . . of national aspirations?" Within the general assumptions that there would be no major war and that military expenditure would continue at a high level, the study makes projections concerning supply and demand for material resources. These, in turn, are made to depend upon projections of past trends in population, labor force, and GNP. For such a long period of time slight changes in the trend have enormous repercussions on future levels, so for several basic economic patterns three sets of trend lines—high, medium, and low—were drawn, yielding three sets of projections for the year 2000.

A number of the projections arise from the basic assumptions. Residential construction, for example, is expected by 2000 to have increased by 5½ times the 1960 value, considerably more than investment in new plant and equipment because of the high rates of family formation allowed for in all the population projections.

Naturally not all of the projections can be made on the basis of extrapolation of past trends. In many of them technical considerations were crucial. The study assumed that there would be a further shift in energy use toward electricity, and that by the end of the century roughly half of all electricity generated would come from nuclear reactors. Where technological assumptions of this nature have to be made, the study for the most part confines itself to presently known techniques and their diffusion rather than to technically feasible but economically untried innovations.

The study has been the subject of considerable interest not only in Government and educational institutions but in industry as well. A large part of its effect is that it purports to be a total forecast of the U.S. economy. As a result, it is able to balance out and test specific projections against one another. If it projects sharp increases in the use of aluminum for auto engine blocks, it must somehow make that projection consistent with what it can project—and to some extent defend—for the production of aluminum and for the production and consumption of steel. Partial technology-related forecasts—confined to one industry or to one technology—may escape this useful discipline.

6. *Research and Development Planning.* The planning of magnitude and directions of investment in research and development for both industry and Government is a species of investment problem so different in relation to technology-related forecasting that it demands separate treatment.

Investment in a course of technical research and development rests on indirect or explicit estimates of the consequences of pursuing that path as against the consequences of pursuing alternative paths. It includes a continuing estimate of feasibility and economic consequence, as well as an estimate of what the technical estimates of others, or their likely success, will be.

In the military, particularly, efforts have been made to develop more or less formal methods for R. & D. investment planning. Some of the methods used may be described as forced strategic thinking, in which a group attempts to lay out all the factors affecting some situation, and where and how that situation and the relevant factors fit into some general framework. A study with the acronym PATTERN, standing for Planning Assistance Through Technical Evaluation of Relevance Numbers, has been published by Honeywell, Inc. Its purposes were—

> to develop the appropriate technological data and present a national process to aid both Government and industrial decision makers in the allocation of present technological resources toward solutions of forecasted problems in the achievement of the national security objectives in the 1968–78 time period.

Another study, *Projected International Patterns* from the Tempo Division of General Electric, suggests ways in which planning military research and development programs can be carried out: (1) By the identification and likelihood of future political problems and the programs likely to result from them, (2) by delineating all possible technological solutions available, and (3) by identification of the preferred technological solution in terms of political or budgetary or other requirements. These are but two examples of a number of analytic frameworks into which planning for the future can be placed. Usually subjective estimates are given to the likelihood and the timing of the occurrence of problems, possible solutions to them, and the possible costs and preference ordering of the solutions.

A considerable amount of work has gone into improving the quality of the input data for these efforts. At present this consists of gathering the opinions of experts. The several sectors of the main branches of the armed services have prepared long-range plans using techniques comparable to those described above.

A particularly interesting and elaborate one, *Project Forecast*, was carried out between April and September 1963 by the Air Force. The general purpose was to propose plans for weapons systems research and development in the Air Force for the period 1965–75.

A working group of prominent scientists made projections concerning technological possibilities in the period in areas of conceivable interest to the Air Force. The group also visited industrial laboratories, and assisted them in developing ideas by suggesting possible prototypes and small-scale developments.

Other panels had the tasks of estimating the extent of potential threat to be faced in 1970, translating the technological information into weapons systems, ensuring that such systems were viable within policy and military requirements, costing the various systems in accordance with the Department of Defense's program budgeting procedures, and reviewing all the systems to select the most suitable.

The question arises on the extent of consensus among experts as to what are feasible technological developments. A recent study at the Rand Corp. was addressed to this question by means of an experiment.

Again a panel of approximately 150 experts was selected for six areas of interest. These areas included possible scientific and technological breakthroughs, but only one area, weapons systems, was directly military, and one was war prevention.

A series of mailed questionnaires was sent out at approximately 2-month intervals. The panel on scientific breakthroughs, for example, was asked to list "major inventions and scientific breakthroughs in areas of special concern to you which you regard as both urgently needed and feasible within the next 50 years." Two months later respondents were presented with the 49 items collected previously and asked to indicate the probability of actual implementation for each item in a range of time intervals from this year to 2013, and never. For 10 of the 49 items there was reasonable consensus and the experts were so informed and asked to comment. Some of the remaining 39 items were also presented to the respondents again, after some rewording in the interests of clarity, with requests for comments, as before, when the median year answers were outside the interquartile range of years.

Although divergence of opinion persisted on a number of items there was also a considerable convergence on a substantial number. Apart from the intrinsic interest of the topics, not relevant here, it is useful to note that the spread of predictions of the date of some future event widens with time, and in fact the interquartile range tends to be roughly equal to the expected distance in the future. The median was usually about one-third of the distance along from the lower end of the interquartile range.

The discussion of this approach to technological forecasting has been undertaken at such length because it represents a radically different approach from that of modifying the trends of the past on the part of a small body of research workers. This polling of the high calibered also aims to show modifications away from past trends, but is, of course, on a radically different scale. This military-type forecasting takes place within a quite different set of economic constraints both from that of the now military public sector and from the private economy. It has been developed, however, at a period when tools have also been developed within the Department of Defense for determining the economic rationality of alterative military projects.

The studies indicate little about the accuracy of the forecasts with respect to timespan. On this question, however, our discussions with a number of military persons were helpful, and also showed remarkable agreement. Where some checking of previous forecasts had been done, it was consistently found that the difficulties of achieving short-term goals (2 to 3 years) were underestimated, while the difficulties of longer term goals (5 to 10 years) were grossly exaggerated.

This experience may indicate that engineering development problems tend to be more difficult than people realize, or that even experts cannot really see the potential in current developments. Or, as two of our military informants suggested, it may be that some particular parameter of technological development against time or against effort follow an S-shaped curve where after a slow beginning rapid progress is made up to some saturation point, after which extra units of effort or time seem to lead to negligible improvement.

For specific and short-term research planning problems military groups appear to use the same analytic techniques described earlier. Where there is a well-known relationship, simple formulas can be used, for example, to express the range of aircraft in terms of aerodynamic properties, or of fuel consumption of the engine, or of the logarithm of the structural efficiency of the vehicle. The equations help to determine whether it is critical to improve the aerodynamic characteristics or the weight, and show that a choice must be made between range and payload.

These forecasting techniques, with very few exceptions, share with straight trend analysis the inability to spot in advance the advent of a new technological development. In other words, they are all concerned in their various ways with the development of known principles or with the diffusion of known techniques through the system.

7. *The Social Impact of Technical Change.* We turn now to efforts made to forecast diffusion through the economy of technological changes thought to have important social implications. These include, principally, the studies of introduction of the kinds of technological change popularly known as automation.

One such study, *The Impact of Office Automation in the Internal Revenue Service*, carried out by the Bureau of Labor Statistics, followed the planning and administration of a changeover to automatic data processing of tax returns in Atlanta, Ga. The impact on employees was measured, and some of the problems encountered were described. These included unwillingness to move to a new location and job, in part because of fear of financial loss on sale of a house or loss of a spouse's income. No employee was laid off, and retraining programs were offered. The changeover will not be completed until 1966 in Atlanta, and the report expresses concern as to whether the record of no layoffs can be maintained if there is no change in employee immobility.

A wider review, *A Study of the Impact of Automation on Federal Employees*, was carried out for a subcommittee of the House Committee on Post Office and Civil Service. The study was carried out by surveying all agencies and employee organizations which had been affected in the past "to determine the significance of the future impact of automation on Federal civilian employees." In other words, present experience was to be analyzed to determine likely future problems by a study of cases rather than of statistical time series data.

This study also found that total manpower requirements would rise though demand for strictly clerical employees would fall, and that therefore reassignment and retraining could take care of those affected provided there was no great resistance to relocation. As the BLS study had pointed out, retraining employees was less of a problem than was finding enough people skilled in the use of computers.

Another study, by the Diebold group, recommends and uses the method of making a detailed case study of one industry, communications, and relating this industry's experience to expected similarities in other industries likely to be affected. The higher the worker's skills and educational level, the greater the chance that his earnings rise in the face of technological change. Education confers convertibility on the skills of an individual worker. Contrary to the findings of the Department of Labor study of 36 industries, the Diebold group reported for the telephone industry that "it is expected that employment will increase over the next 5 to 10 years."

A proposal to make systematic use of the case study approach for the purpose of developing an "early warning system" to identify changes in manpower requirements in industry has been described in a draft report, *Use and Analysis of Unit Operations*, from Arthur D. Little, Inc. This study breaks traditional occupations into constituent parts—"cutting," "carrying materials," "positioning," etc.—to estimate consequences and requirements for skills occasioned by technological change and cutting across standard industrial categories.

In one way or another, all studies examined in this category analyzed a case or a series of cases, including the introduction of a new technology, ascertained effects on workers and on skill requirements, and then made tentative inferences concerning effects of analogous changes for broader segments of industry.

8. *Economic Theory and Theories of Technological Change.* Many economic and particularly econometric studies have been carried out for the purpose of producing forecasts or predictions concerning the level of some economic variable at a specified future date. Few of these forecasts have involved technological forecasts, and few have included factors for technological change. In the Leontief input-output model, for example, the combination of factors of production including technologies necessary to production is assumed constant.

In the present state of economic theory technological change is recognized as highly relevant, but tends to be approached obliquely. We have the productivity series of Kendrick (*Productivity Trends; Capital and Labor*) and of the Bureau of Labor Statistics (*Trends in Output Per Man-Hour in the Private Economy*), which show a slight increase in average annual rate of growth in productivity in the last 15 years compared with the preceding 40, and which are attributed in part to technological change. From these studies and that of Reddaway and Smith ("Progress in British Manufacturing Industries in the Period 1948–54") we can deduce that these productivity increases tend to occur most when production itself is also rising. These series have led to the suggestion that the relation between productivity and output provides us with a method for studying technological change. In the study of productivity much work has recently gone into the question of which factor of production—capital or labor—has experienced the greater impact of technological change, or whether such change affects both factors equally.

Much of the recent concern with technological change among economists has focused on this relationship between productivity and output or, as it is sometimes put, between technical change and economic growth. In addition to the studies already mentioned, significant work in this area has been done by Leon Greenberg of the Department of Labor, Richard Nelson of the Rand Corp., and Joseph Peck of Yale University, all of whom tend to emphasize the tendency of technological change to go hand in hand with increased output. The issue is one of obvious importance to national policy concerning employment and GNP.

The above represents one dimension of a theory of technological change. Efforts to develop such a theory in relation to the economy and to society as a whole have generated an enormous literature which ranges from figures such as Schumpeter, Ogburn, and Gilfillan, to contemporary writers such as Machlup (*The Production and Distribution of Knowledge in the United States*), Mansfield ("Technical Change and the Rate of Innovation"), and Jacob Schmookler ("Bigness, Fewness, and Research"). This literature is concerned with establishing a language for the introduction of new technology, a theory of the conditions of technological change, characterization of the technological change (as proceeding, for example, in slow steps or in "leaps"), and data which could provide indexes of technological change.

In addition to general works such as those of Schumpeter, Ogburn, Gilfillan, and, more recently, Mansfield, Nelson, and Peck, there have been an increasing number of studies of patterns of technological change in specific industries in segments of the economy—including the radio and electric lamp industries (W. R. Maclaurin, *Invention and Innovation in the Radio Industry*), textile, building, and machine tools (Arthur D. Little, *Patterns and Problems of Technical Innovation in American Industry*), and many others.

One of the most promising lines of investigation here is that of Edwin Mansfield. In a series of articles published by the National Science Foundation, he has examined aspects of *diffusion* of technological innovation through the economy; that is, the spread of new technology within and across industrial boundaries. One of his most interesting findings is that the time taken for an innovation to be diffused through most of the firms in an industry can vary from 2 to 28 years. The speed of adoption of a new technique in a particular firm seems to be related to the size of that firm and its expectation as to profit from investment in the new technique. It does not seem generally related to the firm's rate of growth, profit level, liquidity, profit trend, or the age of a firm's management personnel.

Finally the two major opposing economic views of technological change also could theoretically be developed as tools for forecasting. One is represented by Hicks and Fellner. Summarized briefly, it states that technological change takes place in response to changes in the relative prices of factors of production—steel and aluminum in cars, for instance—together with the elasticity of demand for the product; that is, the expandability of the market if the price is relatively lowered. If we could predict trends in relative factor prices and in the elasticity of demand, we could presumably predict the incidence of technological change.

The alternative view associated with the National Bureau of Economic Research is that individual industries show a pattern or life cycle of varying types of technological change in early life, saving labor, and in later life, saving capital. This view, too, could be used for prediction purposes if we knew enough about life cycles of industries. It is, of course, possible that these theories are not mutually exclusive. In its early days the market for a new product is expanding and relatively elastic, so it may tend to disregard economies of capital. When it has ceased its initial expansion, the market will appear less elastic than before. New capital investment will then seem more than normally heavy a burden and then encourage economies in its use.

Even more speculative efforts to build theories of technological change out of the operations research and systems communities look to the building of models and simulation of the process of technical innovation and of diffusion—for example, Ackoff, Forrester, and Roberts. Here, even more clearly, the theoretical work is at so early a stage of development that its forecasting utility is indeterminate.

Finally, the effort to build large-scale models of the entire economy has reached the stage where the proponents of the input-output approach, such as Wassily Leontief and Marshall Wood, believe in the feasibility of introducing technological process coefficients which would change according to ascertainable patterns over time. Such an input-output model would be a tool for making in a rigorous and detailed way the sort of economywide predictions now made qualitatively and broadly in studies such as those of Resources for the Future. But the development of such advanced input-output models is still only a gleam in their authors' eyes.

It is fair to say, in spite of these efforts, that there is currently no adequate theory of technological change which would permit technological forecasting as an application of this theory for any of the uses listed above, although forecasters might well profit by efforts to make their judgments in the light of some of the existing theories.

Conclusions

Our conclusions will be addressed to these questions:

> What activities are now underway in current technology-related forecasting?

What methods are used? What is known about their validity?

What new methodologies for technology-related forecasting could be improved or extended on the basis of current use or developed afresh?

1. There is a good deal of actual forecasting which is technologically related. Almost none (with the exception of certain military efforts) is confined to technology.

2. But almost any forecast could be—and perhaps should be—technologically related. The problems and possibilities of technological forecasting cannot be discussed separately from the problems and possibilities of forecasting generally.

3. People undertake forecasting activities for a variety of purposes—all of them related to planning—and the subject matter and methods vary widely with the use. These are outlined in chart 1.

4. The principal uses technology-related forecasting is put to can be grouped under the headings of manpower policy and program, investment planning (ranging from the corporation or industry to the economy as a whole), and planning of research and development investment.

5. Most technology-related forecasting has to do with forecasting the social or economic effects (manpower demand, industrial growth, dislocations of workers, drain on resources) of technology already in being. Here, the technology-related aspect of the forecast has to do with the diffusion of technology, rather than with innovation and invention. The exceptions to this are concerned mainly with R. & D. planning. The principal methodological distinction, then, is between forecasting the rate and direction and effect of technological diffusion, as against forecast/planning of invention or innovation.

6. With respect to the forecasting related to the diffusion of technology, in spite of the diversity of use and subject matter there is considerable similarity of approach. Certain trends (growth in GNP, productivity, population, labor force, etc.) are taken as basic and extrapolated to some future time. These trends are then modified by the other trends or by qualitative judgments covering other factors. Considerations of technology currently enter such forecasts as such a judgmental factor, modifying a basic trend in output, productivity, or the like.

7. The basis for these technologically related judgments is generally "expert opinion," which ranges from the judgment of the forecaster to the judgments of elite experts carefully screened and tested for internal consistency.

8. With respect to invention and innovation, forecasting and planning are generally inseparable. Focus is generally on "possible developments"—whose generation is a matter of invention or of expert opinion—and then on spelling out the possible consequences of successful implementation of the development for the system of interest. Where formal techniques have been employed, they seem to be used primarily as a means of asking "what if . . ." questions and as a discipline for drawing out the implications of alternative answers.

9. The field of technology-related forecast, whether related to diffusion or to invention and innovation, is notable for a lack of effort at validation. We could discover little or no evidence covering the validity of forecasts in any of the fields examined.

10. There is an understandable tendency to emphasize present technology in most forecast efforts. The assumption tends to be that only technologies currently in existence will influence the economy or society within the period of the forecast.

11. There is considerable activity among economists and social scientists aimed at the development of theories of technological change, but there is little hope in the near future of presenting technology-related forecasts as applications of the theory.

12. There are more useful tools for assessing systematically the effects of technical change—diffusion, innovation, or invention—once assumed than for estimating the change itself.

CHART 1. FORECAST METHODS AND USES

Uses of technological forecasting	Type of method	Sample forecast	Timespan	Geographic scope	Specificity	Validity	Forecast
I. Manpower supply and demand: (a) BLS *Occupational Outlook* includes detailed occupational studies such as that of scientific and technical manpower carried out for NSF.	Demand is projected for the products of the industries in which each occupation is employed, modified by changes in labor productivity, hours worked, etc., and compared with trends in supply to each occupation with recent information, where available, to obtain net figures.	"Despite this increase the number of new graduates seeking employment in the profession may fall short of demand. Thus employment opportunities for new graduates will probably continue to be very good through the 1970's."	To 1975—10 years.	National	Varied, from broad occupational groups to detailed occupations; e.g., biochemists, brickmasons, waiters.	A sketchy evaluation from the same group as the forecast found that of 1949 satisfactory. Others have criticized.	
(b) By industry and region: Corplan IIT.	Use of historical, economic and technical data, supported by use of interpretive analysis and estimates.	"It is estimated that there will be an estimated need for 200,000 to 300,000 programers by 1970" (*The Office Industry in the United States*, p. 35).	10 to 20 years.	Chicago metropolitan area.	Varied; vol. 8 concerns white collar occupations; e.g., systems analysts, and keypunch operators.	Indeterminate.	
II. Investment planning—A. Private: (a) Overall; McGraw-Hill.	Trend analysis of relevant economic statistics, e.g., GNP, R&D, labor force, investment combined with impressions drawn from interviews with informed observers of industrial and other sectors.	"By 1970 the cost of basic research will run more than $3 billion and will account for a bigger share of the total R&D dollar than it does now" (p. 11). Chart 10 shows change from 8¢ to 13¢ as "basic research's share of R&D dollar."	15 years—1960–75 for most of the report.	National	Varied, from fue and power to electrical appliances.	Indeterminate	McGraw-Hill.
(b) Specific; Stanford Research Institute.	See above	"Between 100 and 120 jet cargo aircraft will be sold by 1975, with total cumulative sales volume reaching perhaps $900 million" (p. 1).	13 years—1962–75.	National	Highly specific: Air cargo discusses methods of production, share of market for freight, rates.	Indeterminate	SRI.
III. Research and development planning—In what direction, given the relations between systems needs and technical possibilities: (a) Pattern, decision-making for national U.S. military planning.	A flexible method of developing data for and analyzing a complex system such as national security objectives, for which decision factors concerning technological resources can be expressed numerically and handled by computer.	On the question of which military systems should be improved first: "The detection, discrimination, and tracking came out far ahead of the other subsystems that need improving, with counter measures reflecting the least emphasis in upgrading that should be required in the next few years" (p. 43).	4 to 14 years (1964 report for objectives in 1968–78).	National	Varied due to flexibility, from widest national goals to: "2-man controllable shielded vehicle for indigenous particle valiation protection" (p. 27).	Indeterminate, necessarily limited by quality of input data, facts, and judgments.	I pattern.
(b) Project forecast	1. Identifying areas of promising technical development by using prominent scientists; 2. considering the use of these techniques in military systems, analyzing the cost/benefit alternative of different systems; 3. feeding back the results, together with political and other considerations, to reach planning decisions.	A new prototype material shows promise of having a higher strength to weight ratio in air transportation systems. This will ultimately permit greater air transportation capacity to be reached, either through longer range or higher speeds.	From 1963 to "post-1970."	National	-------------------	Indeterminate	Project forecast.

CHART 1. FORECAST METHODS AND USES—Continued

Uses of technological forecasting	Type of method	Sample forecast	Timespan	Geographic scope	Specificity	Validity	Forecast
III. Research and development planning—Con.							
(a) Technological forecasting by R. Lenz (not strictly a forecast but a review of methods).	Review of methods all of which "explicitly predict quantitative improvements of technical performance to be achieved at definite future time." Especially (1) predicting 1 parameter by means of others; (2) assumption of exponential growth rate in certain engineering parameters.	Extension of speed trend of military aircraft to Mar. 4, 1966, leads to prediction: "Structural and materials developments for an airframe capable of operation at 800° F. surface temperature of Mar. 4 speeds will occur not later than 1965-66" (p. 60).	To 1966; in 1962.	National..	Varied: Aspects of aircraft production and performance.	1 or 2 examples of showing method applied to past is correct.	

APPENDIX 2

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THE EFFECT OF WAGES ON THE RELATIVE EMPLOYMENT OF UNSKILLED LABOR

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III-241

ABSTRACT

The hypothesis that a rise in the price of unskilled labor relative to the price of skilled labor will induce a fall in the relative employment of unskilled labor, ceteris paribus, is tested in this paper.

The hypothesis is tested by correlating the wages of unskilled relative to skilled labor against the employment of unskilled relative to skilled labor and changes in these variables. In both correlations a cross section of as many as 65 SMSA's (Standard Metropolitan Statistical Areas) is used. Data from the 1960 census and the *Occupational Wage Survey* are utilized for these experiments.

Three findings are required to support the hypothesis that changes in the relative price of unskilled labor result in changes in the relative employment of the unskilled: (a) Relative employment and wage changes are negatively correlated; (b) no other reasonable hypothesis explains the correlation; (c) there is no reason to believe the causation runs the other way.

We found that the wages of unskilled relative to skilled blue-collar workers have risen, while the wages of unskilled relative to skilled white-collar workers have fallen from 1953–65 and 1960–65.

A significant but small negative correlation was found between relative employment and wage changes across SMSA's for blue-collar workers for the fiscal year period 1962–65. This period includes the recent increase of 25 percent in the statutory minimum wage.

A positive correlation was found between relative employment and wage changes across SMSA's for white-collar workers. The difference in our results for blue-collar and white-collar may come about for a number of reasons. The most likely reason is that there is more variation in the relative supply schedule of blue-collar labor and in the relative demand schedule of white-collar labor across SMSA's.

The estimates of occupational employment by SMSA used in this study were very crude. Hence it was surprising to find statistically significant correlations between relative wages and employment. The correlation coefficients, however, were not high. We do not know if this is because the data are crude or because relative wage changes are at best a small determinant of relative employment changes.

Even if relative wage increases resulted in increases in the absolute level of unemployment, other studies have shown that increases in aggregate demand can counteract this influence.

We have argued that increases in the minimum wage could lead to decreases in the relative employment of unskilled labor. Labor market programs such as retraining and youth employment programs may increase the relative employment of unskilled workers. The extent to which increases in the minimum wage or labor market policy result in changes in total employment, not just changes in relative employment, is not studied. Because a combination of fiscal, monetary, and labor market policies will alter total and/or relative employment, we cannot condemn minimum wages if they are desirable on other grounds.

The choice is, therefore, clearly not one of simply easing minimum wages or full employment, but rather of some combination of minimum wage, labor market policy, full employment, and price policies.

CONTENTS

	Page
1. Introduction	III-247
2. Some possible models	249
3. The results	251
4. Recommendations for further study	256
5. Conclusions, limitations, and policy implications	257
Appendixes:	
A. A description of the data	259
B. Job descriptions	263
C. Community wage surveys	267

The Effect of Wages on the Relative Employment of Unskilled Labor

1. Introduction

In 1964, while the overall civilian labor force unemployment rate was 5.2 percent, the unemployment rate of unskilled workers was 10.6 percent. Since 1958 the overall unemployment rate has fluctuated between 5.2 and 6.8 percent, while the unemployment rate of unskilled workers has remained between 10.6 and 14.9 percent. For the same period the unemployment rate of skilled workers fluctuated between 4.2 and 6.8 percent, reaching the low of 4.2 percent in 1964.[1]

It is interesting to contrast the 7-year period 1951–57 with the 7-year period 1958–64. Business upturns and downturns were common to both. In the former, the unemployment rate of skilled workers fluctuated from 2.4 to 4.9 percent, while the unemployment rate of unskilled workers fluctuated from 5.6 to 10.7 percent. The following observations emerge from these data:

> 1. The unemployment rate of unskilled workers has persistently been more than double the unemployment rate of skilled workers since 1951.
>
> 2. The unemployment rate of skilled and unskilled workers has on the average been higher since 1957 than it was before 1957.

A clearer picture of these relationships is shown in table 1.

While it is apparent that the unskilled unemployment rate has been increasing since 1957, it is not apparent that the relative rate has differed in the two 7-year periods.

TABLE 1. UNEMPLOYMENT RATES FOR SKILLED AND UNSKILLED WORKERS AND RELATIVE RATE, 1947–64

Year	Skilled[1]	Unskilled[2]	Relative[3]
1947	3.8	7.5	1.97
1948	2.9	7.5	2.59
1949	5.9	12.9	2.19
1950	5.6	11.7	2.09
1951	2.6	5.6	2.15
1952	2.4	5.7	2.38
1953	2.6	6.1	2.35
1954	4.9	10.7	2.18
1955	4.0	10.2	2.55
1956	3.2	8.2	2.56
1957	3.8	9.4	2.47
1958	6.8	14.9	2.19
1959	5.3	12.4	2.34
1960	5.3	12.5	2.36
1961	6.3	14.5	2.30
1962	5.1	12.4	2.43
1963	4.8	12.1	2.52
1964	4.2	10.6	2.52

[1] Skilled=craftsmen, foremen, and kindred workers.
[2] Unskilled=laborers except farm and mine.
[3] Unskilled/skilled unemployment rates.

SOURCE: *Manpower Report of the President*, 1965, p. 207.

The behavior of relative unemployment has been discussed by Kalachek in an MIT Ph.D. thesis and a Joint Economic Committee study paper, "Higher Unemployment Rates, 1957–60: Structural Transformation or Inadequate Demand."[2] Kalachek regressed the experienced worker unemployment rate for 1948–57 against the unemployment rate of laborers and craftsmen. The regression predicted quite well unemployment rates of laborers and craftsmen for 1958 to 1960. R. A. Gordon, who has examined relative unemployment rates in a way similar to that employed here, concluded that structural unemployment has not worsened.[3] Lester Thurow's paper, "The Changing Structure of Unemployment: An Econometric Study," reached similar conclusions.[4]

These studies have supported the view that the increase in the overall unemployment rate from 1957 to 1962 can be attributed to an inadequacy of aggregate demand, and not to structural changes in the American economy. Critics of this approach have raised a number of objections:

> 1. While the previously cited analysis explains the *change* in the unemployment rate from 1957 to 1962, it does not attempt to explain the *level* of structural unemployment. The previous analysis tells us that a relative unemployment factor of 2.0 to 2.5 has been normal in the postwar United States, but does not tell

---

[1] The unemployment rate of the census occupation category "laborers, except farm and mine" is used to represent the unemployment of unskilled workers. The unemployment rate of the census occupation category "craftsmen, foremen, and kindred workers" is used to represent the unemployment of skilled workers.

[2] United States Congress, Joint Economic Committee, Subcommittee on Economic Statistics (Washington: Government Printing Office, 1961).

[3] "Has Structural Unemployment Worsened?," *Industrial Relations* (May 1964), pp. 53–78. Gordon, however, used as one measure of structural unemployment the change in the difference between the proportion of laborers unemployed as a fraction of total unemployment minus the proportion of laborers in the labor force.

[4] *The Review of Economics and Statistics* (May 1965), pp. 137–149. Thurow uses an econometric model to predict the effects of changes in aggregate economic variables on unemployment.

us the reasons for this level or the ways of reducing it.[5]

2. This analysis uses the unemployment rates of last occupational attachment. These rates are subject to two kinds of errors:

a. If unskilled workers leave the labor force rather than continue to seek employment, they are no longer classified as unemployed. Their unemployment may only be disguised, however. In the absence of certain structural changes or in the presence of a higher level aggregate demand, they might have been employed.

b. If blue-collar unskilled workers seek employment in other occupations, such as unskilled service occupations, and obtain casual employment in these occupations only to be subsequently laid off, they are classified as unemployed service workers, not unemployed blue-collar unskilled workers, as they probably should be.[6]

3. This analysis does not deal with relative white-collar unemployment at all because data are not available.

4. The analysis does not explain another phenomenon, the decrease in employment of unskilled workers. Unskilled employment dropped from 6.1 percent total employment in 1947 to 5.2 percent in 1964.[7]

For these four reasons, some questions have been raised about the determinants of unemployment of unskilled laborers. Several hypotheses have been put forward to explain unskilled unemployment:

1. The postwar acceleration in the rate of technical change has resulted in the contraction of firms and industries customarily employing large numbers of unskilled laborers.

2. The postwar acceleration in technical change has increased skill requirements, decreasing the demand for unskilled workers at prevailing wage levels.

3. There is an insufficiency of aggregate demand. Only at or near full employment will the unemployment rates of unskilled workers approach those of skilled workers.

4. Certain frictional characterisics are responsible for the high unskilled-skilled relative unemployment ratio. Unless these frictions can be removed, the relative rate will remain at 2.0 to 2.5. These frictional characteristics include such factors as:

a. Less perfect job information for unskilled workers;

b. Lack of education, which makes job hunting more difficult for unskilled workers;

c. Discrimination, particularly against Negroes. Technical change and wage structure might also be logically classified as frictional characteristics; however, they are presented separately.

5. The unemployment rate of unskilled laborers is really an illusion. Many unskilled workers are not really in the labor force.

6. Certain changes in tastes have occurred so that goods requiring a larger proportion of skilled workers are demanded or services are substituted for goods.

7. Demographic changes in the labor force have increased the supply of unskilled labor.

8. Narrowing or excessively narrowing wage differentials, whether brought about by collective bargaining, minimum wage laws, or other institutions, have induced the substitution of capital and other grades of labor for unskilled labor.

We test only a variant of the last hypothesis. The approach followed in the remaining sections is to compare the behavior of relative wages and relative employment and changes in the relatives. A cross section of Standard Metropolitan Statistical Areas was used for this comparison. Both correlation and regression analysis were used.

In order to demonstrate that changes in relative wages have induced changes in relative employment, three conditions are required: (1) A significant negative correlation between changes in relative wages and employment; (2) the absence of any other reasonable hypothesis to explain this correlation; and (3) the absence of any reason to believe the causality runs the other way.

---

[5] The unemployment rate can be thought to be an inverse function of the level of aggregate demand as well as a function of the structure of the economic system. In most economic analyses the structure is assumed to remain constant. For illustrative purposes only, we express the unemployment rate in the simple linear form: $U=a+bY$. Y is a variable representing the level of aggregate demand, while a and b are parameters which are determined by the structure of the economic system. Minimum wage laws, labor union wage policy, the pace of technological change, or retraining programs affect the structure of the economic system and hence changes in these variables could alter a and b.

[6] Robert Solow, "The Nature and Sources of Unemployment in the United States," Wicksell Lectures 1964 (Stockholm, 1964), pp. 39–40.

[7] *Manpower Report of the President* (March 1965), p. 203. See also footnote 1. For the first 9 months of 1965, unskilled employment has risen to 5.5 percent of total employment, *Monthly Report on the Labor Force,* October 1965.

2. Some Possible Models

What we would have to do to test directly the hypothesis that minimum wage laws and labor unions affect occupational wage differentials would be to examine two areas, one with labor unions and minimum wage laws and one without either. If the areas were identical in all other respects, we could compare the behavior of wage differentials and relative and absolute employment in each. If they were different, we would conclude that the minimum wage laws and labor unions must have been the cause of the difference. Obviously, this experiment is impossible, as there are no two areas satisfying the conditions of the experiment.

In order to make meaningful policy decisions, such as should the minimum wage law be increased or should labor unions be subject to increased government regulations, other tests must be adopted. We could, for example, compare the behavior of relative employment and wages: (1) In a unionized and nonunionized industry or plant; (2) in two industries, one subject to the minimum wage law, one not subject to the minimum wage law; (3) at two points in time, before and after unions and minimum wage laws became important; and (4) after the minimum wage law was adopted in various industries which were not previously covered.[8]

The difficulty with all of these tests as well as the test presented in this paper is that we cannot separate the various influences affecting relative wages and employment.[9] According to the report to the OECD, *Wages and Labor Mobility:*

> A number of different factors, some social, some economic, and some institutional appear to explain the long-term tendency to tightening of occupational wage structure. It is impossible to disentangle their separate effects.[10]

This study asks if the occupational wage structure has some effect on relative employment. Incidental to this attempt, a few strands of evidence are presented which examine the impact of labor unions and minimum wage laws on relative occupational wage differentials. We examine only the short-run impact of these two forces on relative wages and do not investigate their impact on total employment.

Our analysis is divided into four sections:

A. Wage Differentials

A comparison of the ratio of unskilled to skilled wages over time is made to see if wage differentials have widened, narrowed, or remained unchanged. A widening of wage differentials occurs when the ratio of unskilled to skilled wages falls; a narrowing occurs when the unskilled-skilled wage ratio rises.[11]

B. Correlation of Relative Wages and Employment

The hypothesis is tested that SMSA's in which unskilled wages are relatively low compared with skilled wages will show relatively high employment of unskilled workers relative to skilled workers. Relative wages and employment are correlated.

The levels of relative wages and relative employment in different SMSA's are influenced by many factors, such as industrial composition, ethnic characteristics of the work force, average company size, and capital per worker. Analysis of the relatives does not tell us whether the Federal minimum has different effects on employment across SMSA's during the same period because the Federal minimum is the same for all SMSA's, unless the minimum wage had differential effects in different areas which we could isolate. We can, however, determine how much of the variation in relative employment can be accounted for by variation in relative wages.

Our study deals with relative employment, not relative unemployment. The analysis of the relationship between relative employment and wages is less complex than the relationship between relative unemployment and wages. Whether a disemployed worker becomes unemployed, leaves the labor force, or changes occupations depends on other variables which are not investigated in this study. Furthermore, the measurement of unemployment rates of last occupational attachment are of questionable value. Finally, the only occupational unemployment rates available for cross-section purposes are the 1950 and 1960 census rates. The use of these rates is unsatisfactory for several reasons (see appendix A).

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[8] See various studies conducted by the U.S. Department of Labor's Wage and Hour and Public Contracts Divisions related to section 4(d) of the Fair Labor Standards Act.

[9] See, however, H. G. Lewis, *Unionism and Relative Wages in the United States* (Chicago: University of Chicago Press, 1963) esp. pp. 232–3.

[10] A report by a group of independent experts (Organization for Economic Cooperation and Development, July 1965), p. 119.

[11] There are other ways of measuring wage differentials. Instead of taking the ratio of unskilled to skilled wages, we can take the difference. Since the difference may depend on price changes, we may also deflate the difference by some price index.

C. Regression Analysis

Multiple regression analysis is used to explain relative employment by relative wages.[12] First, the simple regression between relative wages and relative employment across SMSA's was tested. Then, other variables were introduced to attain a more complete explanation of the behavior of relative employment. A cross section by labor markets was used. Other variables introduced were population of the labor market in 1950, unemployment in the labor market, a south-nonsouth dummy variable, and lagged dependent and independent variables.

The area unemployment rate was used as a proxy for the tightness of the labor market. Population was introduced because it was thought that relative wages and employment might behave differently in different-size labor markets, and a geographic dummy was introduced to see if the behavior of southern and nonsouthern relatives differed.

D. Changes in the Relatives

Section D reports changes in relative wages and relative employment across SMSA's. This technique is desirable for several reasons: First, it washes out many interregional and interindustrial correlations which distort the relation we are testing; second, it allows us to make some inferences about causation.

We hypothesize that the change in wage relatives from 1962 to 1965 causes the change in employment relatives from 1964 to 1965. By letting *t* represent the years 1962, 1963, and 1964, respectively, we can test to see if the wage change from 1962 to 1965, the period of the initial increase in the minimum wage, had the most effect on employment relative changes. Since we expected the employment adjustment to lag behind the change in wages, we hypothesize this kind of lag model.

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[12] Simple regressions of relative wages as the independent variable and relative employment as the dependent variable are not fully identified. Robert Solow illustrates this problem in the following example: Suppose there is an autonomous increase in unskilled wages relative to skilled; then unskilled employment should decrease relative to skilled, ceteris paribus. But if there is an autonomous increase in the demand for unskilled labor relative to skilled, the unskilled wages should rise relative to skilled. In the first case there is negative correlation between relative employment and relative wages; in the second case there is positive correlation. A more careful analysis is needed to separate demand and supply.

3. The Results

Data utilized in this section are described in detail in appendix A.[13]

A. Wage Differentials

A comparison of wage differentials in 1953 and 1965 is presented in table 2 for blue collar-all industry average, blue collar-manufacturing, and white collar-all industry average for 17 labor market areas.

Counting up the number of areas where narrowing, widening, and no change occur (counting to 2 decimal places) shows that there is no universal trend for narrowing to occur. In the white-collar occupations, narrowing occurred in 3 of the 17 major labor markets reported: Baltimore, Dallas, and Memphis. The combined population of these 3 areas comprises less than 10 percent of the combined population of the 17 areas. Among blue-collar occupations the trend was toward narrowing. Narrowing occurred in 9 of the SMSA's in manufacturing and 8 of the SMSA's in the all-industry average. In all three categories, wage differentials remained unchanged in three SMSA's. We conclude from this evidence that blue-collar worker wage differentials have narrowed, but not by much.

Many factors could explain the widening of wage differentials in the white-collar occupations, such as increased demand for skilled white-collar workers relative to unskilled. A complete theory is not attempted in this paper.

To examine further the behavior of wage differentials by SMSA, we counted the number of SMSA's where differentials widened, narrowed, or remained unchanged (rounded to two decimal places) since 1960. The results are given in Table 3.

The results are qualitatively identical to those shown in table 2. It must be noted, however, that white-collar wage differential widening was less pronounced and blue-collar manufacturing wage differential narrowing was more pronounced.

Our results also tend to be corroborated by other findings. George Hildebrand and George Delehanty found a narrowing of wages in a majority of cities for blue collar manufacturing.[14] Hildebrand and Delehanty caution the reader to keep in mind the small ranges involved in the differentials and the nature of the data.

Using another method, Martin Segal found a widening of wage differentials in female white-collar occupations. He computed coefficients of variation for female office workers in 18 cities for 1949 and 1961 and found that wages widened in 12 of the 18 cities. Segal also found a widening of skill differentials in 11 cities for blue-collar occupations from 1951 to 1961.[15] Segal's findings, while contrary to ours, are for a different time period.

Before 1945–47, blue-collar wage differentials underwent a great deal more narrowing than after the war. A study by Harry Ober found a narrowing of percentage differentials between skilled and unskilled jobs from 105 percent in 1907 to 80 percent in 1931–32 and 55 percent in 1945–47.[16] The Bureau of Labor Statistics estimated the differential at 37 percent in 1953 and 1963. "The method used by the Bureau for the postwar differentials was to relate the median of citywide average differentials for 12 skilled jobs and janitors in manufacturing."[17]

To make inferences about the widening or narrowing of wage differentials by counting the number of SMSA's is not as satisfactory as using the

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[13] While a detailed description of the data is given in appendix A, a few biases of the blue-collar data are reported here: First, the *Occupational Wage Survey* upon which most of the results are based surveys only a few occupations. Of these, nine occupations were chosen to represent skilled and unskilled occupations. Included in our sample are seven skilled maintenance occupations (men): Carpenters, electricians, machinists, auto mechanics, mechanics, painters, and tool and die makers. Also included are two unskilled occupations (men): Janitors and laborers (material handlers).

Data from the *Occupational Wage Survey* are especially unsuitable for determining the impact of minimum wage laws on wage differentials. The impact of minimum wage laws is expected to be greatest on nonmetropolitan areas where wages are lowest (see U.S. Department of Labor, Wage and Hour and Public Contracts Divisions, *An Evaluation of the Minimum Wages and Maximum Hours Standards of the Fair Labor Standards Act*, January 1965) and in small firms (see David Kaun, "Minimum Wages, Factor Substitution and the Marginal Producer," *Quarterly Journal of Economics*, August 1965, pp. 483 ff.). The *Occupational Wage Survey* excludes workers in firms employing fewer than 50–100 workers and is confined to metropolitan areas.

Second, we are indebted to Gary Becker for pointing out that correlations of occupational wages and employment derived from the *Occupational Wage Survey* are biased toward −1 since wage rate estimates are not independently estimated by the BLS.

Third, employment estimates in the *Occupational Wage Survey* are very crude.

For these reasons, we should use census employment relatives with *Occupational Wage Survey* relatives. However, differences in census employment relatives cannot be calculated. (See appendix A.)

Fourth, fringes and related benefits are excluded from the *Occupational Wage Survey* data.

[14] "Wage Levels and Differentials," unpublished.

[15] "Occupational Wage Differentials in Major Cities During the 1950's," in Mark Perlman, ed., *Human Resources in the Urban Economy* (Baltimore: Resources for the Future, Inc., and Johns Hopkins Press, 1963), pp. 195–207.

[16] "Occupational Wage Differentials: 1907–1947," *Monthly Labor Review*, July 1948, pp. 127–134.

[17] U.S. Department of Labor, Bureau of Labor Statistics, *Wages and Related Benefits, Part II: Metropolitan Areas, United States and Regional Summaries*, 1962–63, Bull. No. 1345–83, p. 48.

TABLE 2. WAGE DIFFERENTIALS UNSKILLED/SKILLED WAGES, FISCAL 1953–65

	White collar			Blue collar					
	All industries			All industries			Manufacturing		
Standard Metropolitan Statistical Areas:	*1953*	*1965*	*Direction*	*1953*	*1965*	*Direction*	*1953*	*1965*	*Direction*
Atlanta	0.7337	0.7281	U	0.5604	0.5633	U	0.5767	0.6026	N.
Baltimore	.6889	.7240	N	.6203	.6446	N	.6666	.7151	N.
Boston	.7356	.7081	W	.6927	.6788	W	.7061	.6809	W.
Buffalo	.7351	.7122	W	.7251	.7469	N	.7383	.7522	N.
Chicago	.7498	.7406	W	.6801	.6601	W	.6742	.6392	W.
Cleveland	.7592	.7210	W	.7163	.7228	U	.7428	.7425	U.
Dallas	.7326	.7474	N	.6114	.5798	W	.6263	.6250	U.
Denver	.7415	.7304	W	.6775	.7196	N	.6756	.7281	N.
Los Angeles	.8108	.7721	W	.7023	.7159	N	.7222	.7159	U.
Memphis	.7395	.7706	N	.5714	.5664	U	.6043	.5929	W.
Milwaukee	.7729	.7345	W	.7268	.6923	W	.7327	.7045	W.
Minneapolis	.7208	.7103	W	.7107	.7485	N	.6981	.7117	N.
Newark-Jersey City	.7334	.7197	W	.7355	.7507	N	.7190	.7611	N.
New York City	.6855	.6864	U	.6911	.7090	N	.6666	.6851	N.
Portland, Oreg	.7805	.7754	U	.7391	.7307	W	.7500	.7197	W.
San Francisco	.7820	.7695	W	.7092	.7584	N	.7356	.7534	N.
St. Louis	.7288	.7204	W	.6730	.6637	W	.6745	.6803	N.

SOURCE: Computed from U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Wage Survey*.

KEY: W=widened, N=narrowed, U=unchanged.

TABLE 3. BEHAVIOR OF WAGE DIFFERENTIALS IN SMSA'S, FISCAL 1960–65

Behavior	Blue-all	White-all	Blue-man
Widened	14	26	9
Narrowed	24	15	26
Unchanged	14	5	12

Source: Computed from *Occupational Wage Survey*.

BLS estimate of the all United States average wage.

Table 4 shows annual changes in skilled and unskilled wages by region for the U.S. for selected periods. From February 1961 to February 1965, the skilled maintenance trades (men) wage index increased 11.4 percent while the unskilled plant workers (men) wage index increased 13.2 percent. The qualitative and quantitative measures agree.

The Bureau of Labor Statistics also calculated median annual average wage increases for the 1953–64 period in 20 areas surveyed in both periods. They found annual increases in wages for skilled maintenance workers to be 4.1 in all industry and 4.0 in manufacturing, and for unskilled plant workers, 4.2 in all industry and 4.2 in manufacturing.[18]

If minimum wage laws narrowed wage differentials, one would expect unskilled wages to increase relative to skilled wages during the period after the minimum wage law became effective, ceteris paribus. One would also expect wage differentials to narrow most in the area where the law had the most impact, ceteris paribus, like the South.

The timetable for escalation of the minimum wage according to the 1961 amendments to the Fair Labor Standards Act follows:[19]

1. For employees covered by the act prior to the 1961 amendments:

Date	*Minimum hourly rate*
September 1961	$1.15
September 1963	1.25

2. For newly covered employees:

Date	*Minimum hourly rate*
September 1961	$1.00
September 1964	1.15
September 1965	1.25

Comparing the timetable with table 4 reveals that relative wages narrowed in the South in the 3 years that the minimum wage was escalated, and widened in the 2 years that the minimum wage was not escalated. However, this is not evidence that minimum wage laws permanently narrowed wage differentials. Wage differentials narrowed almost identically in the South and nonsouth for the fiscal period 1960–65. Whether this narrowing was due to cyclical factors, minimum wage laws, or any of a number of other possible causes, we cannot determine with certainty.

B. Correlation of Relative Wages and Employment[20]

The correlations of relative wages and employment for various years are shown in table 5. Un-

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[18] U.S. Department of Labor, Bureau of Labor Statistics, *Wages and Related Benefits, Part III: Metropolitan Areas, United States and Regional Summaries*, 1963–64, Bull. No. 1385–82, p. 72.

[19] 75 Stat. 65 (1961).

[20] To give the reader some idea of the absolute level of blue- and white-collar wages by skill, median wages for 18 large SMSA's in 1965 are:

Skilled white collar (per week)	$98.00
Unskilled white collar (per week)	70.50
Skilled blue collar (all industries, per hour)	3.32
Skilled blue collar (manufacuring, per hour)	3.34
Unskilled blue collar (all industries, per hour)	2.35
Unskilled blue collar (manufacturing, per hour)	2.33

TABLE 4. PERCENTS OF INCREASE IN AVERAGE EARNINGS OF SELECTED OCCUPATIONAL GROUPS—ALL INDUSTRIES AND MANUFACTURING IN ALL METROPOLITAN AREAS, UNITED STATES AND REGIONS, FOR SELECTED PERIODS

Period [1] and region [2]	All industries		Manu acturing	
	Skilled maintenance trades (men) [3]	Unskilled plant workers (men) [3]	Skilled maintenance trades (men)	Unskilled plant workers (men)
February 1964 to February 1965 [4]				
United States	2.4	2.9	2.2	2.6
Northeast	2.7	3.5	2.5	2.8
South	2.6	3.2	2.4	3.5
North Central	2.1	2.2	2.0	2.0
West	2.4	3.6	1.9	3.5
February 1963 to February 1964 [4]				
United States	2.7	3.1	2.6	2.9
Northeast	2.4	3.1	2.3	2.9
South	2.3	3.4	2.2	3.2
North Central	2.8	3.0	2.7	2.7
West	3.7	3.2	3.8	3.7
February 1962 to February 1963 [4]				
United States	2.7	3.3	2.5	2.8
Northeast	2.6	3.6	2.3	2.7
South	2.6	2.3	2.4	2.1
North Central	2.7	3.2	2.6	2.9
West	2.7	4.1	2.7	3.3
February 1961 to February 1962 [4]				
United States	3.1	3.2	2.9	3.2
Northeast	3.2	3.1	3.1	3.2
South	3.4	4.5	3.1	4.2
North Central	2.9	2.8	2.8	3.0
West	3.3	3.3	2.8	2.6
February 1960 to February 1961 [4]				
United States	3.6	3.6	3.6	3.7
Northeast	3.7	3.6	3.6	3.7
South	3.6	2.6	3.3	3.0
North Central	3.6	4.1	3.6	3.9
West	3.6	3.7	3.8	3.4

[1] Data for the February 1963 to February 1964 and February 1964 to February 1965 increases relate to all 212 Standard Metropolitan Statistical Areas in the United States as established by the Bureau of the Budget through 1961. Data for earlier comparisons relate to 188 areas as established through 1959.

[2] The regions are defined as follows: *Northeast*—Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *South*—Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; *North Central*—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; and *West*—Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Data for the 188 areas exclude Alaska and Hawaii.

[3] Earnings of skilled maintenance and unskilled plant workers relate to hourly earnings excluding premium pay for overtime and work on weekends, holidays, and late shifts.

[4] Average months of reference. Individual area surveys were conducted from July through the following June.

SOURCE: U.S. Bureau of Labor Statistics, *Daily Labor Report*, Sept. 14, 1965.

TABLE 5. CROSS-SECTION CORRELATIONS BY SMSA'S FOR RELATIVE WAGES AND RELATIVE EMPLOYMENT FOR BLUE AND WHITE COLLAR WORKERS

Relative employment	Relative wages		
	1960	1964	1965
White collar—all industries, 1964	0.06	0.26	0.22
White collar—all industries, 1965	.08	.24	.20
Blue collar—all industries, 1964	–.13	–.17	–.17
Blue collar—all industries, 1965	–.16	–.19	–.19
Blue collar—all industries, 1960 [1]	–.48	–.47	–.45
Blue collar—manufacturing, 1964	–.24	–.29	–.32
Blue collar—manufacturing, 1965	–.26	–.30	–.34

[1] Census employment estimates.

SOURCE: Computed from *Occupational Wage Surveys* except as noted.

less otherwise indicated, the data are taken from the *Occupational Wage Survey*, published by the Bureau of Labor Statistics. A more detailed description of the data is contained in appendix A. Census data for relative employment are also used for blue-collar workers. The data for 1960 relative wages are limited to fewer SMSA's than later data. Fewer observations were available for white-collar occupations and manufacturing. For a list of the observations, see appendix C.

Five conclusions emerge from table 5:

> **1. There is a negative correlation between relative wages and employment in blue-collar occupations. On the average, in the areas where the relative employment of the unskilled is greatest, their relative wages are lowest.**
>
> **2. The correlations tend to be higher for manufacturing than for all industries. This is also consistent with a priori reasoning. The finer the industrial breakdown we examine, the less relative employment in different areas varies according to industrial composition at this level of aggregation.**
>
> **3. Using census data for employment almost triples the correlation between relative wages and employment. This is probably because the *Occupational Wage Survey* estimates of employment are subject to unusually high sampling errors, the census employment estimates include a more representative sampling of all occupations, and the census includes employees of all size firms.[21]**
>
> **4. The white-collar relative wage and employment correlations are positive.**
>
> **5. Whether wage relatives lead or lag employment relatives, the correlation remains about the same. This suggests that correlation of relatives allows no inferences to be drawn about causality.**

C. Regression Analysis

In this section the simple regression of relative employment on relative wages is reported for white collar-all industry average, blue collar-all industry average, and blue-collar manufacturing. Y designates relative employment (unskilled to skilled employment) and X designates relative wages (unskilled to skilled wages). The effects of the introduction of several other variables is then reported. For each regression, the following statistics are reported: $\overline{R}^2$, regression coefficients and their standard errors in parentheses.[22]

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[21] We are indebted to Martin Segal for suggesting this last point.

1. Simple regressions

a. White collar-all industry average

$$Y_{65}=.1469+1.0152X_{65} \quad \overline{R}^2=.0223$$
$$(.4897) \quad (.6719)$$

b. Blue collar-all industry average using *Occupational Wage Survey* employment

$$Y_{65}=2.8829-1.9932X_{65} \quad \overline{R}^2=.0225$$
$$(.8542) \quad (1.2673)$$

c. Blue collar-all industry average using census employment

$$Y_{60}=.7426-.6226X_{60} \quad \overline{R}^2=.2155$$
$$(.1076) \quad (.1607)$$

d. Blue-collar manufacturing

$$Y_{65}=3.1024-3.0148X_{65} \quad \overline{R}^2=.1031$$
$$(.7508) \quad (1.0803)$$

In addition to what we have discovered from our correlation analysis, we learn that relative wages explain a small but statistically significant amount of the variation in relative employment across SMSA's.

2. Multiple regressions

a. Population: In the blue-collar worker regressions, this coefficient was only significant in the presence of the lagged dependent variable. The sign of this coefficient was always positive, indicating the larger the SMSA, the larger relative employment. Eliminating this variable from the relative blue-collar regression makes little difference. In the white-collar worker regressions it tends to be more important, but the effect tends to be opposite, since the sign of the coefficient is always negative. The effect tends to be much stronger in the white-collar occupations, raising $\overline{R}^2$ from about .05 to about .14.

b. The unemployment rate of the SMSA makes little difference in either the blue- or white-collar regression.

c. Lags: Introducing a lagged independent and dependent variable to our simple regression for blue-collar-all industry average, we get:

$$Y_{65}=.2186+.9651\ Y_{64}+3.6017\ X_{64}-3.8845\ X_{65}$$
$$(.1678)(.0225) \qquad (1.606) \qquad (1.6116)$$
$$\overline{R}^2=.9674$$

Because the coefficient of the lagged dependent variable is so close to one and the coefficients of the other two variables are so close to one another, the first difference form of the equation is motivated. The introduction of lags in the white-collar case is of little help in explaining the white-collar employment differential. The behavior in blue-collar manufacturing is similar to blue collar-all industry average.

D. Changes in the Relatives

The results from the previous section suggest that a first difference model should be tested. $Y_{65}-Y_{64}$ was regressed against $X_{65}-X_{64}$, $X_{65}-X_{63}$, and $X_{65}-X_{62}$. The resulting estimating equations for the blue collar-all industry average were:

$$(1)\quad Y_{65}-Y_{64}=-.0258-3.7122\ (X_{65}-X_{64}) \quad \overline{R}^2=.0622$$
$$(.0157)\ (1.6205)$$
$$(2)\quad Y_{65}-Y_{64}=-.0227-3.4929\ (X_{65}-X_{63}) \quad \overline{R}^2=.0803$$
$$(.0157)\ (1.3603)$$
$$(3)\quad Y_{65}-Y_{64}=-.0148-3.2631\ (X_{65}-X_{62}) \quad \overline{R}^2=.1094$$
$$(.0161)\ (1.0959)$$

Note that in each successive lag, $\overline{R}^2$ increases and the B coefficient of $(X_{65}-X_{65-t})$ falls where t=1, 2, and 3.

We did the same experiment for blue-collar-manufacturing. The simple correlations of $Y_{65}-Y_{65}$ against $X_{65}-X_{65-t}$ are:

when $t=1964$, $r=-.16$
$t=1963$, $r=-.32$
$t=1962$, $r=-.34$

The last lag in wages, $X_{65}-X_{62}$, which gives the best explanation of relative employment changes, includes the first step in the change in the minimum wage, effective in fiscal year 1962.

On the basis of these regressions we are able to account for an estimated 6 to 10 percent of the variation of changes in relative employment. However, if we had annual census estimates of relative employment by SMSA, we suspect correlation between changes in relative employment and wages would be much higher in absolute value as we would be able to explain more of the variance. We estimate that we could explain 25 percent of the variation in employment with better employment estimates.[23]

The mean relative wage differences for blue collar workers all-industry average are:

1965–1964	0.15
1965–1963	0.25
1965–1962	0.51

The mean employment change for 1965–64 was −3.15.[24]

To illustrate our findings, suppose the relative employment and relative wages of all SMSA's were at the value of the average of all SMSA's in 1964. We let relative employment and relative

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[22] Several other forms of this model can also be tested. One such model which is motivated from microanalysis has been suggested by Frank Brechling. The model is:

$$\frac{N_u}{N_s}=\frac{A}{B}\ \frac{W_u}{W_s}\frac{(\alpha_1\underset{\blacktriangledown}{-}B_1)}{(B_2\underset{\blacktriangledown}{-}\alpha_2)}\ N_t(\alpha_3\underset{\blacktriangledown}{-}B_3)$$

where N=employment, W=wages, s=skilled, u=unskilled and t=total. α_1, α_2, α_3, B_1, B_2 and B_3 are parameters. Our model is identical to Professor Brechling's if $\alpha_1-B_1=B_2-\alpha_2$ and $\alpha_3-B_3=0$.

From the basic labor demand model of R.G.D. Allen, H.G. Lewis derives the model:

$$\frac{N_s}{N_u}=\left(\frac{W_u}{r}\right)^A\left(\frac{W_s}{W_u}\right)^{-B}$$

where r is the rate of return on capital. Only if A=O does our model reduce to that of Lewis. If we assume r is the same in all SMSA's, we can estimate A from our data.

[23] Compare regression 1c with 1b in section 3. Then compare 1b, 1c with equation 3, this section. See also footnote 13.

[24] These numbers are in index number form and must be divided by 100 to relate to the regressions.

wages take on the value of 100 for 1964. We then convert the actual regression of $Y_{65}-Y_{64}$ against $X_{65}-X_{64}$ to index number form. We have:

$$Y_{65}-Y_{64}=-1.62-1.58\ (X_{65}-X_{64})$$

From this equation we can see the effect upon relative employment of any change in relative wages. A 1 percent rise in relative wages will result in a 3.2 percent fall in relative employment: $[(-1.62)+(-1.58\times1.0)]$. But note half of this fall is contributed by the constant term. A 10 percent rise in the relative wages will result in a 17.4 percent fall in relative employment, $[(-1.62)+(-1.58\times10)]$. A constant level of relative wages will result in a 1.6 percent fall in relative employment.[25]

In the undifferenced model, we pointed out that the all-industry relative employment would be a function of differing industrial composition. We hypothesized, therefore, that the manufacturing blue-collar relative employment and wages should be more highly correlated than for the all-industry average. Such was the case. In the differenced model, variations in percentage rates of change of employment would be a function of the rates of change of industrial composition. We could expect a priori that this difference is smaller across SMSA's. Again such was the case. The correlation of employment change and wage change was quite similar in the all-industry average and manufacturing.

The behavior of relative wage and employment levels is quite different in the South than in the nonsouth. The mean relative wages and employment for our three groups are given in table 6.

As is apparent from table 6, relative wages are lower in the South than the nonsouth for blue-collar occupations, the greatest difference occurring in the all-industry average. The possible reasons for this differential are many: Differences in industrial mix, lower educational attainment of the labor force, less labor union organization, differing role of Negroes, and less effective minimum-wage laws in the South. Without saying anything about cause and effect, we observe that in the South, where the ratio of unskilled to skilled wages is less than in the North, the ratio of unskilled to skilled employment is highest. Relative wages and employment were correlated separately for the South and nonsouth. (See table 7.)

TABLE 6. MEAN RELATIVE WAGES AND EMPLOYMENT, SOUTH AND NONSOUTH, 1965, USING *Occupational Wage Survey* DATA

Occupational category	South [1]		Nonsouth	
	Wages	Employment	Wages	Employment
Blue collar—all industries	0.583	1.761	0.709	1.506
Blue collar—manufacturing	.642	1.182	.712	.952
White collar—all industries	.721	.945	.731	.863

[1] See appendix C for list of southern SMSA's.

TABLE 7. CORRELATIONS BETWEEN RELATIVE WAGES AND EMPLOYMENT, SOUTH, NONSOUTH, AND ALL AREAS, 1965

Occupational category	South	Nonsouth	All
White collar—all industries	0.34	0.19	0.20
Blue collar—all industries	−.16	−.06	−.19
Blue collar—manufacturing	−.27	−.26	−.34

It is apparent that much of the explanatory power in correlation and regression of relatives comes from the North-South difference in relative employment. However, when we regress differences in relative employment and wages across SMSA's, the North-South differential plays little or no role in the explanation. (See table 8.)

TABLE 8. CORRELATION BETWEEN DIFFERENCES IN RELATIVE WAGES (1965–1962) AND RELATIVE EMPLOYMENT (1965–1964), SOUTH, NONSOUTH, AND ALL AREAS

Occupational category	South	Nonsouth	All
White collar—all industry	0.11	0.17	0.15
Blue collar—all industry	−.39	−.40	−.35
Blue collar—manufacturing	−.49	−.20	−.34

In table 8, it can be seen that the U.S. correlation is less than the correlation for either the North or the South or both.

In table 7, the U.S. correlation is greater than either the North or South correlations for blue-collar workers.

Finally, we note that the difference in relative wages (1965–1962) and relative employment (1965–1964) during the period when the minimum wage was raised 25 percent in manufacturing was very high (−.49) for manufacturing blue-collar workers in the South. Considering the many difficulties involved with *Occupational Wage Survey* data, this correlation is surprisingly high. It suggests minimum wage laws may have induced changes in relative employment.

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[25] Such an analysis is for illustrative purposes only. We can only roughly guess that a 1-percent increase in relative wages gives rise to a 2 to 4 percent fall in relative employment. However, better data might allow us to trace more of the secular decline to structural changes. Economists call the coefficient of $(X_{65}-X_{64})=1.58$. the elasticity of substitution.

4. Recommendations for Further Study

This study has raised many questions that require further research, for example:

1. The impact of labor unions and minimum wage laws on occupational wage differentials.

2. The factors underlying the supply of different grades of labor.

3. Cyclical behavior of relative wage differentials and employment.[26]

4. The mechanism underlying the substitution of different grades of labor and capital for one another. Semiskilled labor might be incorporated in such a study.
5. The impact of technical change on wage and employment differentials.
6. Changes in relative wages and relative employment by industry across areas.
7. Obtaining better estimates of changes in relative employment by occupation by area over time. Such employment estimates are not currently available, but should be gathered by the Bureau of Labor Statistics, the Bureau of Employment Security, or the Social Security Administration. We would favor the inclusion of broad occupational categories on SSA and BES reports.[27]

8. Changes in relative employment and relative wages within a given area over time.

9. The impact of relative wages on relative employment in the small firm and in nonmetropolitan areas.

10. Cyclical and secular changes in the quality of different grades of labor.[28]

11. The effect of labor market policy on total and relative employment.

12. Cyclical and secular occupational mobility.

13. A complete explanation of the different behavior of relative wages and employment for white- and blue-collar workers.

14. Several of the eight initial hypotheses raised in the introduction to this paper.

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[26] Occupational and employment differentials may vary over the business cycle.

Many theories of relative employment and/or wage behavior have been put forward. Three of these are illustrated below:

a. Unskilled wages remain approximately the same throughout the cycle since a large supply of unskilled labor is always available at a social minimum wage. The wages of skilled labor exhibit more variability, however, since shortages of skilled labor may occur more readily and result in increases in skilled wages. Relative wages would narrow during a contraction and widen during a boom according to this theory. See also M. W. Reder, "Wage Structure and Structural Unemployment," *Review of Economic Studies,* October 1964, pp. 309–322.

b. During a contraction, businessmen may hoard skilled labor rather than fire and rehire them, since the costs of rehiring them during the anticipated expansion may exceed the costs of hoarding them. Since the cost of hiring unskilled labor is less, the theory predicts relative employment will fall during a recession and rise during a boom. If the supply of labor did not vary over the cycle, this theory would predict a rise in relative wages during a boom and a fall during a recession.

c. If the supply of unskilled workers diminished during a recession while the supply of skilled workers and the relative demand for both skills remained constant, relative employment would fall and relative wages would rise during the recession.

All of these theories are over-simplified versions of how differing supply and demand assumptions can give rise to a different cyclical behavior of relative wages and employment. For a test of some of these theories as well as a good discussion of secular wage differentials, see K. J. C. Knowles and D. J. Robertson, "Differences between the Wages of Skilled and Unskilled Workers, 1880–1950," *Bulletin of the Oxford University Institute of Statistics,* April 1951.

It may seem to the reader that since we are taking a cross-section analysis . . . the business cycle should make no difference as all areas are in the same phase of the business cycle. However, the cyclical impact of the business cycle in all areas is definitely not the same. As evidence of this one need only look at any of the movements in regional economic indicators.

[27] See the recommendations of the *Report of the Committee on Evaluation of Wage Data for Interarea Comparisons,* Interstate Conference on Labor Statistics, June 1964, U.S. Department of Labor, Bureau of Labor Statistics, p. 28.

[28] But see Reder, *ibid.*

5. Conclusions, Limitations, and Policy Implications

This paper put to a test the hypothesis that increases in the relative price of unskilled labor will result in a substitution of other grades of labor and capital for unskilled labor, ceteris paribus.

The procedure used to test this hypothesis was to correlate and regress changes and levels in relative unskilled and skilled wages and employment. A cross-section analysis of labor market areas (SMSA's) using data from the *Occupational Wage Surveys* was undertaken for blue-collar workers, white-collar workers, and blue-collar workers employed in manufacturing.

1. For blue-collar occupations, this analysis consistently showed a significant but low negative correlation between relative wages and employment. The correlation was increased in absolute value when census employment data were used and when changes in relative wages and employment were correlated. Unfortunately, differences in relative employment could not be derived from census data. Regression analysis indicated that generally in those areas where relative wages were increasing fastest, relative employment was falling fastest. The analysis further told us that changes in relative wage rates could account for an estimated 6 to 25 percent of relative employment changes. If we had data on relative wages of small producers and relative wages in nonmetropolitan areas, we would expect to find a higher correlation. We conclude that relative wage changes in blue-collar occupations have given rise to relative employment changes.

2. For white-collar occupations a positive correlation between relative wages and relative employment was found.

3. Our analysis has taken a very elementary model and tested its implications. Many relationships were left out that may be important. We generalize on the basis of our findings to date but readily admit that further research and a more sophisticated model may yield different results.

4. The difference in our results for blue- and white-collar workers is probably attributable to more variation in the relative supply schedule of blue-collar labor and in the relative demand schedule of white-collar labor across SMSA's.

We now return to our initial hypothesis by examining the effect of unionism on relative employment and the effect of minimum wage laws on relative employment, and conclude with our policy recommendation.

A. Effect of Unionism on Relative Employment

Our findings neither support nor refute the hypothesis that trade unionism has had an effect on the level of unemployment of unskilled workers in the last 15 years. If unions play a role in establishing wage differentials, they probably affect relative employment.

B. Effect of the Federal Minimum Wage on Employment

To the extent that minimum-wage laws narrow the wage differential between unskilled and skilled, they result in some substitution of skilled for unskilled labor, ceteris paribus. Our findings have shown that changes in relative wages have had a small but significant effect on relative employment of blue-collar workers. This alone does not prove that increases in the statutory minimum wage have created unemployment of unskilled workers, because:

1. Changes in wage relatives could have come about for reasons other than an increase in the minimum wage.

2. Changes in relative employment need not give rise to decreases in absolute employment.

3. Decreases in employment need not be associated with increases in unemployment.

Our findings were that changes in relative wages accounted for 6 to 25 percent of the variation in the change in relative employment for blue-collar occupations.

A few strands of evidence emerge from our study consistent with the hypothesis that the recent increases in the Federal minimum wage law have narrowed occupational wage differentials at least in the short run:

1. The correlation between relative wages and employment is most significant for the period before the increase in the minimum wage through fiscal 1965 and for this period in the South.

2. Wage narrowing in blue-collar occupations in the South since 1960 occurred in each of the 3 years after the minimum wage was escalated. In the 2 years when escalation did not take effect, wages widened somewhat the following year. Data were first available in 1960. The wage narrowing was much greater than the wage widening.

In the individual labor markets surveyed, the change in relative wages has always been small. If Congress were to pass a law that increased the minimum wage from $1.25 to $1.75, the effect on wage differentials and relative employment might be greater than the effect investigated here.

C. Policy Recommendations

On the basis of the small but significant relationship which we found between changes in relative wages and relative employment, and on the basis of the strands of evidence that suggests that unionism or minimum wage laws may have had some short-run effects on relative wages, we recommend:

1. *Government activity consistent with the goals of the Employment Act of 1946.* Fiscal or monetary policy can do a great deal to increase overall employment and reduce overall unemployment. It is a lot more desirable for substitution of skilled for unskilled employment to take the form of retraining rather than laying off unskilled workers. It is a lot more desirable for total employment to increase. A decline of the ratio of relative unskilled to skilled employment from 150,000/500,000 =.30 to 300,000/1,500,000=.20 is going to create less hardship than a decline from 150,000/500,000 to 100,000/500,000.

2. *Labor market policy.* By undertaking sound labor market policies, the Government can retrain workers who lose their jobs, provide better job information to job seekers and employers, and continue its special programs designed to alleviate youth unemployment, depressed area unemployment, and the unemployment of underprivileged groups.

3. *Minimum wage laws and labor unions.* On the basis of this study no recommendation can be made as to whether unions should be subject to increased regulation or whether minimum wage laws should be increased. Even if the methodology employed in this study conclusively demonstrated that an increase in the Federal minimum wage law would decrease the relative employment of unskilled workers, one must weigh the other advantages of increasing the minimum wage against this hypothetical disadvantage. If increasing the minimum wage alleviated some poverty, it might be desirable. Similarly, if any legislation to regulate unionism interfered with free collective bargaining, the legislation might be undesirable.

4. *The balanced approach.* By adopting several of the policies discussed above, it may be possible to attain the beneficial effects of free collective bargaining, alleviation of poverty, and full employment. It may not be possible to put these policies into effect simultaneously without some inflation or balance of payments problems. This we do not analyze here.

What we stress is that the choice is not one of higher minimum wages or full employmyent but rather some combination of minimum wage, full employment, inflation, and labor market and balance of payments policies.

Appendixes

APPENDIX A

A Description of the Data

Any body of data is subject to limitations. Unemployment rates may not adequately reflect involuntary labor force dropouts. Gross national product measures contain many arbitrary assumptions. Similarly the data used for this paper are subject to limitations.

It is not usual for an empirical paper making use of unemployment statistics or national income accounting phrases to carry out an extended discussion of the limitations of these concepts. This is because these concepts have been the subject of a voluminous literature. Unfortunately little has been written on the limitations of occupational wage data.[1] In fact, few uses have been made of these data for aggregative economic studies, and the data are therefore fairly unfamiliar to most readers. This appendix provides, therefore, an extensive description and discussion of the data. Appendix B contains a description of the jobs included in our indices. Appendix C contains a list of the labor markets surveyed by the BLS on a comparable basis since fiscal year 1953.

The data required for this study are:

1. Skilled and unskilled wages for blue- and white-collar workers by labor market and by industry.

2. Skilled and unskilled employment for blue- and white-collar workers by labor market and by industry.

3. Population of labor markets.

4. Overall unemployment rates by labor markets.

I. Wages

The only comprehensive primary sources for wages by occupation in the United States are the U.S. Census of Population published by the Bureau of the Census, and *Occupational Wage Surveys*, *Industry Wage Surveys*, and *Wage Chronologies*, published by the Bureau of Labor Statistics.

The census income data are unsatisfactory for several reasons. First, they are based on interview, not establishment data. Second, they include all sources of income, not just wages, although more detailed breakdowns of income are available. Third, they are available only every decade.

The *Industry Wage Surveys* contain much useful information; however, the number of industries which are covered on a comprehensive basis over labor markets is quite limited. However, extensive use of the *Industry Wage Surveys* can provide much additional information. This study does not utilize any information from the *Industry Wage Surveys*.

Wage Chronologies are the most limited of the Bureau of Labor Statistics data. They consist of wage structures of individual companies. Again, the number of companies covered is too limited for the purposes of our study.

The *Occupational Wage Surveys*, which are the most comprehensive source for occupational wage statistics, were utilized for this study. The Bureau of Labor Statistics instituted occupational wage surveys on a community basis in 1948. The earlier studies were limited to office workers and were not comparable to later studies. From fiscal 1952 to 1959, 18 communities were surveyed annually or semiannually. In fiscal 1960, 61 areas were surveyed. Since 1961, 82 areas have been surveyed annually.

Data were collected from 1952 to 1965 for the 18 communities surveyed regularly during the period. Data were also collected from 1960–65 for the areas surveyed throughout that period.

Each community study contains information on wages, the number of workers, and the frequency distribution of wages for each occupation. Some occupations are broken down by sex and industry. The industry breakdowns include manufacturing and nonmanufacturing. Within nonmanufacturing, breakdowns are available for public utilities, wholesale trade, retail trade, finance, and services.

The occupations surveyed fall within the following broad categories: Office occupations, professional and technical occupations, maintenance and powerplant and custodial and material movement occupations. Within these broad categories several occupations are reported.

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[1] But see *Report of the Committee on Evaluation of Wage Data for Interarea Comparisons*, Interstate Conference on Labor Statistics, June 1964, U.S. Department of Labor, Bureau of Labor Statistics.

The Bureau of Labor Statistics prepares job descriptions which it asks its field staff to use in classifying persons in the appropriate occupations. These descriptions provide some standardization to the job descriptions applied in different areas by different regional offices. The descriptions of the jobs studied in this paper are contained in appendix B.

The *Occupational Wage Surveys* contain vast amounts of data. There are, however, several limitations to the *Occupational Wage Surveys* which are set forth here:

1. Occupational descriptions are revised through time making time series comparisons of several occupations impossible. In constructing an index we had to choose between comparability over time or comprehensiveness. We chose the former. This bias was not great in maintenance and powerplant occupations since few job description changes were made over time. This bias was more serious in the office occupations where several job description changes were made.

2. The occupational coverage in the *Occupational Wage Survey* is restricted. The office occupations surveyed are quite extensive. The maintenance and powerplant occupations are quite limited. For example, wages and number of workers are reported for carpenters, electricians, stationary engineers and firemen, helpers, machine tool operators, painters, and plumbers. But these data pertain only to maintenance people. Thus the number of plant workers used in the construction of our indexes of skilled and unskilled blue-collar wages covers less than 7 percent of all plant workers.[2]

3. The surveys are conducted in different months in the different labor areas. Even in the same area they are not always conducted in the same month of the year. However, since 1959, the time between surveys has been 11 to 13 months in nearly all areas.

4. Varying industrial composition alone can account for different wage levels in different cities or a different behavior of wage differentials. No adjustments were made to the raw data to take account of varying industrial mix.

5. Variations in the number of high and low wage firms in an area can affect levels and movements in wages. An exodus of workers from high-wage to low-wage firms can lower the average wage in an area without affecting the levels of pay for any particular job.

6. The wages reported refer to average straight-time earnings and exclude fringe benefits but do include merit wage increases. Jacob Mincer, on the basis of a thesis completed at Columbia by Bob Rice, has suggested that when fringe benefits are included in the definition of wages, occupational wage differentials show more narrowing than if fringes are excluded. Such a result strengthens our finding for blue-collar workers since it implies that a smaller decrease in relative wages gives rise to the same decline in relative employment.

7. Constant employment weights were used to construct the indexes of skilled and unskilled wages. The weights were of course different for each labor market area; however, they were held constant over time. These constant weights were used primarily for computational simplicity.

8. The labor market areas for which occupational wages are collected conform generally to the U.S. Bureau of the Budget definitions of Standard Metropolitan Statistical Areas (SMSA's). The definitions of SMSA's are occasionally revised to include or exclude adjoining counties or towns. These changes have been ignored unless there is a footnote in the community wage survey indicating that the change is a major one. A major change took place in the Philadelphia, New York, and Chicago occupational wage surveys which were expanded in 1963 to conform to the SMSA definition of these areas. It was not possible to make any reliable adjustments of the expansion of the Philadelphia survey so it was dropped from our study. The New York and Chicago surveys contained data for both the new and the old definitions of the labor area, so the old definitions were used for these two areas. Ignoring changes in SMSA's in the remaining areas is probably not serious. We are told by Leo Epstein who conducts the Boston Regional Wage Survey that the change in the definition of the Boston SMSA which added 11 towns in 1959 to the SMSA definition added at most 1 or 2 firms to the 255 already surveyed. But even if the changes were more major in other areas, they only bias our result if they affect the ratio of unskilled to skilled wages or employment.

9. Before July 1959, railroads were excluded in all surveys. After July 1959, railroads were included in all but four areas where they were included in late 1960 in three areas and late 1963 in the fourth. Unpublished data provided by L. R. Linsenmayer indicate that the difference in the estimate of wages by occupation including or excluding railroads for the all-industry average is insignificant for our purposes.[3]

10. The *Occupational Wage Surveys* exclude supervisors, apprentices, trainees, handicapped, part-time workers, learners, beginners, and temporary and probationary workers.

11. The *Occupational Wage Surveys* exclude all firms employing fewer than a specified number, usually 51. This minimum employment in establishments in the scope of our study is not the same for all industries in a given SMSA. It is not the same for the same industry across SMSA's nor is it the same for a given industry in a given SMSA over time. The justification for this minimum establishment size for inclusion in the study is sound. It is very difficult, according to Paul V. Mulkern, to classify occupations in a small firm.[4] The same workman may be a carpenter, machinist, electrician, and painter. This exclusion means that we are not examining the wages of all workers in the particular occupations we are studying but just wages of workers employed in firms employing more than 50 or 100 workers. To make our areas comparable within time, we eliminated all earlier surveys which were not comparable to later surveys. This essentially meant omitting the 1952 data. However, on the basis of unpublished data

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[2] U.S. Department of Labor, Bureau of Labor Statistics, *Wages and Related Benefits: Metropolitan Areas, United States and Regional Summaries:* 1960–61, U.S. Bureau of Labor Statistics Bull. No. 1285–84, U.S. Department of Labor (1962), p. 32.

[3] Mr. Linsenmayer is Assistant Commissioner of Wages and Industrial Relations, U.S. Department of Labor, Bureau of Labor Statistics.

[4] Mr. Mulkern is the Boston Assistant Regional Director for Wages and Industrial Relations, U.S. Department of Labor, Bureau of Labor Statistics.

comparing the 1952 minimum with the later minimum, the differences between the two are insignificant.[5] The closeness of these two bodies of data may indicate one of two things: (a) Amount of total employment accounted for by small firms is insignificant or their wage rates are similar to those of larger firms. (b) The surveying procedure of the Bureau of Labor Statistics fails to represent all the small firms even if the survey is designed to pick them up.[6]

12. The *Occupational Wage Surveys* contain data for similar occupations in all the areas they cover but they are required by confidentiality requirements or statistical method to withhold some data from publication. It was necessary to make interpolations for missing data whenever possible. In some cases the SMSA was eliminated entirely. The omissions were confined primarily to small labor market areas, such as Waterloo, Albuquerque, Oklahoma City, Sioux Falls, Lubbock, and Burlington. To estimate missing wages, three techniques were used: (a) For four white-collar occupations not reported in 1953 in each of the areas studied, a multiple regression of other occupations within the labor market area over time was used to predict the missing wages. Occupations of the same skill level were used to predict each of the four missing occupations. Because of the high correlation of wages of white-collar occupations of similar skills, the estimates of the dependent variable were excellent. ($\overline{R}^2$=.99 or better in most regressions.) (b) Male white-collar salaries were estimated rather arbitrarily where data were missing. It was assumed, for example, that office boys earned as much as office girls. The error, if this assumption is incorrect, is insignificant since the weights assigned to these estimated occupations are small. (*c*) To estimate missing data for a female white-collar occupation or a male blue-collar occupation within a given labor area, an estimate was made by taking the simple mean of all other occupations of that skill for that year for that area and multiplying that by the simple mean of that same occupation for all areas in that year and dividing by the grand mean.[7] Consider the following example:

WAGES BY OCCUPATION

Areas	Occupations		
	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3

To calculate B2, if it were missing, we multiply

$$\frac{B1+B3}{2} \text{ by } \frac{(A2+C2)/2}{(S1+S2)/2}$$

where $S1=(A1+A2+A3)/3$ and
$S2=(C1+C2+C3)/3$

13. The sampling procedure of the Bureau of Labor Statistics in preparing the *Occupational Wage Surveys* is discussed in full in "Techniques of Preparing Major BLS Statistical Series."[8] A briefer description of this method is given below:

Sampling and Estimating Procedures

The sampling plan can be described as a two-stage design consisting of an *area sample* and an *establishment sample.* The area sample is designed to allow presentation of data for all metropolitan areas combined, and the establishment sample is designed to allow presentation of data for each particular area. As was indicated earlier, this bulletin is concerned with the data for all metropolitan areas combined.

The *area sample* of 80 areas in 1963 and 1964 was based on the selection of one area from a stratum of similar areas. The criteria of stratification were size of area, region, and type of industrial activity. Insofar as possible, probability sampling was used and each area had a chance of selection roughly proportionate to its total nonagricultural employment. Thirty-seven of the areas were certain of inclusion in the sample, either because of their size as measured by the 1960 Census of Population, or because of the unusual nature of their industry composition. Each of these 37 areas represented only itself, but each of the 43 other areas represented itself and one or more similar areas, with the data from each area weighted by the ratio of total nonagricultural employment in the stratum to that in the sample area when preparing estimates for all areas combined.

The *established sample* is stratified as precisely as available information permits. Each geographic industry unit for which a separate analysis is to be presented is sampled independently. Within these broad groupings, a finer stratification by product and size of establishment is made. Each sampled stratum will be represented in the sample by a number of establishments proportionate to its share of the total employment. The size of the sample in a particular survey depends on the size of the universe, the diversity of occupations and their distribution, the relative dispersion of earnings among establishments, the distribution of the establishment by size, and the degree of accuracy required.[9] This sampling procedure is subject to statistical error. "The sample is designed so that the chances are 9 out of 10 that the published average does not differ by more than 5 percent from the average that would be obtained by enumeration of all establishments in the universe."[10] In the study reported here, groupings are made of individual data so that the sampling error for the grouping is probably less than that for any individual statistic reported in the wage surveys.

14. White-collar earnings were for weekly salaries. Because areas varied in the number of hours worked per week, some of the variation in wages was accounted for by this variable. Scheduled weekly hours were published by the Bureau of Labor Statistics which would enable the appropriate adjustments to be made. They were not made for this study, however.

15. Our sample of white-collar workers includes a high proportion of female workers. This proportion is higher than in the universe of all white-collar workers. In any case, finding of widening wage differentials among white-collar workers may relate to the behavior of female rather than white-collar workers.

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[5] Mr. Linsenmayer provided this data.

[6] This possibility was suggested by Robert Evans, Jr.

[7] This method of dealing with missing data was suggested by C. Harvey Wilson of the MIT Sloan Computer Facility. This computer facility was used for the computations.

[8] U.S. Department of Labor, Bureau of Labor Statistics Bull. 1168 (1954). A revision is planned, but we are told that the techniques are the same.

[9] U.S. Department of Labor, Bureau of Labor Statistics, *Wages and Related Benefits: Metropolitan Areas, United States and Regional Summaries: 1963–64,* Bull. No. 1385–82 (1965), p. 93.

[10] BLS Bull. 1168, p. 100.

II. Employment

There are two sources for employment data by occupation, the *U.S. Census of Population* and the *Occupational Wage Survey*. For blue-collar occupations, 1960 census data were utilized. In employment for laborers, excluding farm and craftsmen, foremen and kindred workers were used as unskilled and skilled employment, respectively. The *Occupational Wage Survey* estimate of number of workers in each occupation was used for all occupational groups. Several of the limitations that apply to *Occupational Wage Survey* estimates of wages apply to its estimates of employment. In addition:

1. Missing employment was estimated for 1961 on the basis of guesses and the 1960 census. The 1961 estimates were then interpolated to other years on the basis of the ratio of total employment in the given year to 1961 in the occupations for which data were available.

2. The Bureau of Labor Statistics employment estimates are subject to a more serious sampling error than the wage data. As Samuel Cohen puts it:

> Estimates of the number of workers in a given occupation are subject to considerable sampling error, due to the wide variation among establishments in the proportion of workers found in the individual occupations. Hence, the estimated numbers of workers can be interpreted only as a rough measure of the relative importance of various occupations. The greatest degree of accuracy in these employment counts is for those occupations found principally in large establishments. This sampling error, however, does not materially affect the accuracy of the average earnings shown for the occupations. The estimate of average earnings is technically known as a "ratio estimate," i.e., it is the ratio of total earnings (not payrolls) to total employment in the occupation. Since these two variables are highly correlated, the sampling error of the estimate is considerably smaller than the sampling error of either total earnings or total employment.[11]

Unless otherwise specified, all employment estimates in the study utilize the *Occupational Wage Survey*.

In order to calculate differences in employment relatives, *Occupational Wage Survey* data were utilized. The only way it would be possible to utilize census employment by occupation to calculate differences in employment by SMSA and occupation would be to take the difference in employment relatives calculated from the 1950 and 1960 censuses. However the first wage data available are from the 1953 *Occupational Wage Survey*. To use income data from the census was also thought to be undesirable. (See also section A–I.) The 1950 census was also subject to many criticisms.[12]

III. Population

Population by SMSA for 1960 is reported in *Standard Metropolitan Statistical Areas*, 1964, together with descriptions of the SMSA's and changes in their definitions since 1950.[13]

IV. Unemployment

Unemployment rates by labor markets were taken from statistics compiled by State employment security agencies cooperating with the Department of Labor. The data were published in the 1965 *Manpower Report of the President*.[14]

Occupations from the *Occupational Wage Survey* were classified as either skilled or unskilled. These occupations were then weighted by 1961 employment weights to determine an aggregate skilled and unskilled blue- and white-collar wage rate. Employment for this aggregate was also determined by adding together employments in these occupations. A separate breakdown was also made for blue-collar skilled and unskilled in manufacturing. Because of limitations in the data, no other industry aggregates could be constructed.

The blue-collar occupations used to construct our index are similar to the ones used in the Bureau of Labor Statistics index of skilled maintenance and unskilled plant occupations. However, employment estimates and wage levels exclude pipefitters. No index of white-collar occupations by skill was constructed by the Bureau of Labor Statistics. The occupations used in our index and a description of the jobs are in appendix B.

It should be noted that the blue-collar jobs are easier to classify by skill. The classification of various white-collar occupations by skill is subject to greater question.

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[11] BLS Bull. 1168 (1954), pp. 100–1.

[12] The accuracy of 1950 census employment estimates is discussed by Oskar Morgenstern, *On the Accuracy of Economic Observations*, second edition (Princeton: Princeton University Press, 1963), pp. 228 ff. The accuracy of 1950 census income estimates is discussed in The Conference on Research in Income and Wealth, Vol. 23, National Bureau of Economic Research, *An Appraisal of the 1950 Census Income Data* (Princeton University Press, 1958). The 1950 census unemployment estimates were discussed in Gertrude Bancroft, "Current Unemployment Statistics of the Census Bureau and Some Alternatives," in *The Measurement and Behavior of Unemployment*, National Bureau of Economic Research (Princeton University Press, 1957), p. 75.

[13] Bureau of the Budget, Executive Office of the President.

[14] Pp. 234–245.

APPENDIX B

Job Descriptions[1]

I. Office Occupations Skilled

Bookkeeping-Machine Operator, Female, Class A

Operates a bookkeeping machine (Remington Rand, Elliott Fisher, Sundstrand, Burroughs, National Cash Register, with or without a typewriter keyboard) to keep a record of business transactions. Keeps a set of records requiring a knowledge of and experience in basic bookkeeping principles and familiarity with the structure of the particular accounting system used. Determines proper records and distribution of debit and credit items to be used in each phase of the work. May prepare consolidated reports, balance sheets, and other records by hand.

Clerk, Accounting, Male or Female, Class A

Under general direction of a bookkeeper or accountant, has responsibility for keeping one or more sections of a complete set of books or records relating to one phase of an establishment's business transactions. Work involves posting and balancing subsidiary ledger or ledgers such as accounts receivable or accounts payable; examining and coding invoices or vouchers with proper accounting distribution; and requires judgment and experience in making proper assignations and allocations. May assist in preparing, adjusting, and closing journal entries; and may direct class B accounting clerks.

Clerk, Payroll, Male or Female

Computes wages of company employees and enters the necessary data on the payroll sheets. Duties involve: Calculating workers' earnings based on time or production records, and posting calculated data on payroll sheet, showing information such as worker's name, working days, time, rate, deductions for insurance, and total wages due. May make out paychecks and assist paymaster in making up and distributing pay envelopes. May use a calculating machine.

Secretary, Female

Performs secretarial and clerical duties for a superior in an administrative or executive position. Duties include making appointments for superior; receiving people coming into office; answering and making phone calls; handling personal and important or confidential mail, and writing routine correspondence on own initiative; and taking dictation (where transcribing machine is not used) either in shorthand or by Stenotype or similar machine, and transcribing dictation or the recorded information reproduced on a transcribing machine. May prepare special reports or memorandums for information of superior.

Typist, Female, Class A

Uses a typewriter to make copies of various material or to make out bills after calculations have been made by another person. May include typing of stencils, mats, or similar materials for use in duplicating processes. May do clerical work involving little special training, such as keeping simple records, filing records and reports, or sorting and distributing incoming mail. Performs one or more of the following: Typing material in final form when it involves combining material from several sources or responsibility for correcting spelling, syllabication, punctuation, etc., of technical or unusual words or foreign language material; and planning layout and typing of complicated statistical tables to maintain uniformity and balance in spacing. May type routine form letters varying details to suit circumstances.

II. Office Occupations—Unskilled

Biller, Machine (bookkeeping machine), Female

Prepares statements, bills, and invoices on a machine other than an ordinary or electomatic typewriter. May also keep records as to billings or shipping charges or may perform other clerical work incidental to billing operations. Uses a bookkeeping machine (Sundstrand, Elliott Fisher, Remington Rand, etc., which may or may not have typewriter keyboard) to prepare customers' bills as part of the accounts receivable operation. Generally involves the simultaneous entry of figures on customers' ledger record. The machine automatically accumulates figures on a number of vertical columns and computes and usually prints automatically the debit or credit balance. Does not involve a knowledge of bookkeeping. Works from uniform and standard types of sales and credit slips.

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[1] Taken from *Occupational Wage Survey*.

Bookkeeping-Machine Operator, Female, Class B

Operates a bookkeeping machine (Remington Rand, Elliott Fisher, Sundstrand, Burroughs, National Cash Register, with or without a typewriter keyboard) to keep a record of business transactions. Keeps a record of one or more phases or sections of a set of records usually requiring little knowledge of basic bookkeeping. Phases or sections include accounts payable, payroll, customers' accounts (not including a simple type of billing described under biller, machine), cost distribution, expense distribution, inventory control, etc. May check or assist in preparation of trial balances and prepare control sheets for the accounting department.

Clerk, Accounting, Male or Female, Class B

Under supervision, performs one or more routine accounting operations, such as posting simple journal vouchers or accounts payable vouchers, entering vouchers in voucher registers; reconciling bank accounts; and posting subsidiary ledgers controlled by general ledgers, or posting simple cost accounting data. This job does not require a knowledge of accounting and bookkeeping principles but is found in offices in which the more routine accounting work is subdivided on a functional basis among several workers.

Office Boy or Girl

Performs various routine duties, such as running errands, operating minor office machines such as sealers or mailers, opening and distributing mail, and other minor clerical work.

Transcribing-Machine Operator, General, Female

Primary duty is to transcribe dictation involving a normal routine vocabulary from transcribing-machine records. May also type from written copy and do simple clerical work. Workers transcribing dictation involving a varied technical or specialized vocabulary such as legal briefs or reports on scientific research are not included. A worker who takes dictation in shorthand or by Stenotype or similar machine is classified as a stenographer, general.

Typist, Female, Class B

Uses a typewriter to make copies of various material or to make out bills after calculations have been made by another person. May include typing of stencils, mats, or similar materials for use in duplicating processes. May do clerical work involving little special training, such as keeping simple records, filing records and reports, or sorting and distributing incoming mail. Performs one or more of the following: Copy typing from rough or clear drafts; routine typing of forms, insurance policies, etc.; and setting up simple standard tabulations, or copying more complex tables already set up and spaced properly.

III. Maintenance and Powerplant—Skilled, Male

Carpenter, Maintenance

Performs the carpentry duties necessary to construct and maintain in good repair building woodwork and equipment, such as bins, cribs, counters, benches, partitions, doors, floors, stairs, casings, and trim made of wood in an establishment. Work involves most of the following: Planning and laying out of work from blueprints, drawings, models, or verbal instructions; using a variety of carpenter's handtools, portable power tools, and standard measuring instruments; making standard shop computations relating to dimensions of work; and selecting materials necessary for the work. In general, the work of the maintenance carpenter requires rounded training and experience usually acquired through a formal apprenticeship or equivalent training and experience.

Electrician, Maintenance

Performs a variety of electrical trade functions, such as the installation, maintenance, or repair of equipment for the generation, distribution, or utilization of electric energy in an establishment. Work involves most of the following: Installing or repairing any of a variety of electrical equipment, such as generators, transformers, switchboards, controllers, circuit breakers, motors, heating units, conduit systems, or other transmission equipment; working from blueprints, drawings, layouts, or other specifications; locating and diagnosing trouble in electrical system or equipment; working standard computations relating to load requirements of wiring or electrical equipment; and using a variety of electrician's handtools and measuring and testing instruments. In general, the work of the maintenance electrician requires rounded training and experience usually acquired through a formal apprenticeship or equivalent training and experience.

Machinist, Maintenance

Produces replacement parts and new parts in making repairs of metal parts of mechanical equipment operated in an establishment. Work involves most of the following: Interpreting written instructions and specifications; planning and laying out of work; using a variety of machinist's handtools and precision measuring instruments; setting up and operating standard machine tools; shaping of metal parts to close tolerances; making standard shop computations relating to dimensions of work, tooling, feeds, and speeds of machining; knowledge of the working properties of the common metals; selecting standard materials, parts, and equipment required for his work; and fitting and assembling parts into mechanical equipment. In general, the machinist's work normally requires a rounded training in machine-shop practice usually acquired through a formal apprenticeship or equivalent training and experience.

Mechanic, Automotive (Maintenance)

Repairs automobiles, buses, motortrucks, and tractors of an establishment. Work involves most of the following: Examining automotive equipment to diagnose source of trouble; disassembling equipment and performing repairs that involve the use of such handtools as wrenches, gages, drills, or specialized equipment in disassembling or fitting parts; replacing broken or defective parts from stock; grinding and adjusting valves; reassembling and installing the various assemblies in the vehicle and making necessary adjustments; and aligning wheels, adjusting brakes and lights, or tightening body bolts. In general, the work of the automotive mechanic requires rounded training and experience usually acquired through a formal apprenticeship or equivalent training and experience.

Mechanic, Maintenance

Repairs machinery or mechanical equipment of an establishment. Work involves most of the following: Examining machines and mechanical equipment to diagnose source of trouble; dismantling or partly dismantling machines and performing repairs that mainly involve the use of handtools in scraping and fitting parts; replacing broken or defective parts with items obtained from stock; ordering the production of a replacement part by a machine shop or sending of the machine to a machine shop for major repairs; preparing written specifications for major repairs or for the production of parts ordered from machine shop; reassembling machines; and making all necessary adjustments for operation. In general, the work of a maintenance mechanic requires rounded training and experience usually acquired through a formal apprenticeship or equivalent training and experience. Excluded from this classification are workers whose primary duties involve setting up or adjusting machines.

Painter, Maintenance

Paints and redecorates walls, woodwork, and fixtures of an establishment. Work involves the following: Knowledge of surface peculiarities and types of paint required for different applications; preparing surface for painting by removing old finish or by placing putty or filler in nail holes and interstices; and applying paint with spray gun or brush. May mix colors, oils, white lead, and other paint ingredients to obtain proper color or consistency. In general, the work of the maintenance painter requires rounded training and experience usually acquired through a formal apprenticeship or equivalent training and experience.

Tool and Die Maker

(Die maker, jig maker, tool maker, fixture maker, gage maker)

Constructs and repairs machine-shop tools, gages, jigs, fixtures or dies for forgings, punching, and other metal-forming work. Work involves most of the following: Planning and laying out of work from models, blueprints, drawings, or other oral and written specifications; using a variety of tool and die maker's handtools and precision measuring instruments, understanding of the working properties of common metals and alloys; setting up and operating of machine tools and related equipment; making necessary shop computations relating to dimensions of work, speeds, feeds, and tooling of machines; heattreating of metal parts during fabrication as well as of finished tools and dies to achieve required qualities; working to close tolerances; fitting and assembling of parts to prescribed tolerances and allowances; and selecting appropriate materials, tools, and processes. In general, the tool and die maker's work requires a rounded training in machine-shop and toolroom practice, usually acquired through a formal apprenticeship or equivalent training and experience. For cross-industry wage study purposes, tool and die makers in tool and die jobbing shops are excluded from this classification.

IV. Custodial and Material Movement—Unskilled, Male

Janitor, Porter, or Cleaner

Cleans and keeps in an orderly condition factory working areas and washrooms, or premises of an office, apartment house, or commercial or other establishment. Duties involve a combination of the following: Sweeping, mopping, scrubbing, and polishing floors; removing chips, trash, and other refuse; dusting equipment, furniture, or fixtures; polishing metal fixtures or trimmings; providing supplies and minor maintenance services; and cleaning lavatories, showers, and restrooms. Workers who specialize in window washing are excluded.

Laborer, Material Handling

(Loader and unloader, handler and stacker, shelver, trucker, stockman or stock helper, warehouseman or warehouse helper)

A worker employed in a warehouse, manufacturing plant, store, or other establishment whose duties involve one or more of the following: Loading and unloading various materials and merchandise on or from freight cars, trucks, or other transporting devices; unpacking, shelving, or placing materials or merchandise in proper storage location; and transporting materials or merchandise by handtruck, car, or wheelbarrow. Longshoremen, who load and unload ships, are excluded.

APPENDIX C

Community Wage Surveys Conducted by the U.S. Bureau of Labor Statistics Fiscal 1953–65

State and SMSA	Surveyed regularly since—	Code
Alabama, Birmingham	1960	+
Arizona, Phoenix	1960	M, W
Arkansas, Little Rock-North Little Rock	1961	+
California:		
Los Angeles-Long Beach	1953	
San Bernardino-Riverside-Ontario	1960	
San Diego	1963	O
San Francisco-Oakland	1953	
Colorado, Denver	1953	
Connecticut:		
New Haven	1960	
Waterbury	1960	
District of Columbia, Washington	1961	M, +
Florida:		
Jacksonville	1960	M, +
Miami	1960	+
Georgia:		
Atlanta	1953	+
Savannah	1960	W, M, +
Idaho, Boise-Boise City	1960	O
Illinois:		
Chicago	1953	
Rockford	1960	
Indiana:		
Indianapolis	1960	
South Bend	1960	
Iowa:		
Davenport-Rock Island-Moline	1961	
Des Moines	1960	
Waterloo	1961	O
Kansas, Wichita	1961	
Kentucky, Louisville	1961	+
Louisiana, New Orleans	1954	+
Maine, Portland	1960	M
Maryland, Baltimore	1953	+
Massachusetts:		
Boston	1953	
Lawrence-Haverhill	1960	W
Worcester	1960	
Michigan:		
Detroit	1954	
Muskegon-Muskegon Heights	1960	O
Minnesota, Minneapolis-St. Paul	1953	
Mississippi, Jackson	1960	O, +
Missouri:		
Kansas City	1960	
St. Louis	1954	
Nebraska, Omaha	1961	
New Hampshire, Manchester	1961	O
New Jersey:		
Newark and Jersey City	1953	
Paterson-Clifton-Passaic	1960	
Trenton	1961	W
New Mexico, Albuquerque	1960	O
New York:		
Albany-Schenectady-Troy	1960	
Buffalo	1953	
New York	1953	
North Carolina:		
Charlotte	1960	O, +
Raleigh	1961	O, +
Ohio:		
Akron	1960	
Canton	1960	W
Cincinnati	1960	
Cleveland	1953	
Columbus	1961	
Dayton	1960	
Toledo	1961	
Oklahoma, Oklahoma City	1961	O, +
Oregon, Portland	1955	
Pennsylvania:		
Allentown-Bethlehem-Easton.	1960	
Philadelphia	1953	*
Pittsburgh	1960	
Scranton	1961	W
York	1960	
Rhode Island, Providence-Pawtucket.	1961	X
South Carolina, Greenville	1960	W, +
South Dakota, Sioux Falls	1960	O
Tennessee:		
Chattanooga	1961	+
Memphis	1953	+
Texas:		
Beaumont-Port Arthur	1960	W, +
Dallas	1956	+
Fort Worth	1960	+
Houston	1960	+
Lubbock	1960	O, +
San Antonio	1961	O, +
Utah, Salt Lake City	1961	
Vermont, Burlington	1961	O
Virginia:		
Norfolk-Portsmouth and Newport News-Hampton.	1961	O, +
Richmond	1960	+
Washington:		
Seattle	1957	
Spokane	1961	
West Virginia, Charleston	1960	+
Wisconsin:		
Green Bay	1961	O
Milwaukee	1953	

All SMSA's are included in sample unless indicated by the following code:

O Omitted entirely from all tests.
M Omit from manufacturing blue-collar tests only.
W Omit from white-collar tests only.
* Omit after 1962.
X 1960 not comparable.
+ Southern SMSA.

USE OF INVESTMENT TAX CREDIT TO FACILITATE ADJUSTMENT

Prepared for the Commission
by
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United Automobile Workers of America
Detroit, Michigan

CONTENTS

	Page
Basis for proposal	III-273
Proposal	273
Financing	273
Benefits to displaced workers	273
Eligibility requirements	274
Operation of trust fund	274
Effect of proposal	274

Use of Investment Tax Credit to Facilitate Adjustment

Basis for Proposal

There is universal agreement that management, labor, and government should cooperate in an effort to assure that technological progress is achieved without sacrificing human values. The President's Advisory Committee on Labor-Management Policy, for example, in its report on automation dated January 11, 1962, said:

> There is unanimous agreement among the members on these fundamental points:
> 1. Automation and technological progress are essential to the general welfare, the economic strength, and the defense of the Nation.
> 2. This progress can and must be achieved without the sacrifice of human values.
> 3. Achievement of technological progress without sacrifice of human values requires a combination of private and governmental action consonant with the principles of a free society.

While there is agreement on these fundamental points, no working mechanism has yet been created to implement them.

The report of the Commission states in still more specific terms the principle involved. Thus the report includes among the "basic requirements" for individual adjustment situations that:

> . . . the displaced individual must have adequate financial security while searching for an alternative job or while undertaking training,

and that:

> . . . the displaced person should not have to suffer the loss of earned security rights such as vacation, retirement, insurance, and related credits to his total worklife account.

Such a forthright statement of principle deserves to be backed up by concrete proposals for its implementation. The following proposal is put forward with that end in view.

Proposal

This investment tax credit under the Internal Revenue Act would be an appropriate vehicle for implementing the principle, since it is designed to stimulate modernization, and to the extent that it serves that end, it also adds to the human problems resulting from technological change. The investment credit can be used both to provide the incentive for employers to establish programs to meet the problems of workers dislocated from their jobs by reason of technological change, and to provide the necessary resources.

Financing

It is proposed that in each year, one-half of the investment credit to which each firm is entitled would be paid to it directly, and the other half would be placed in reserve in a Government trust fund where it would be held available for a period of 5 years to meet the needs resulting from disemployment of the employees of that firm resulting from technological change. At the end of 5 years, any amounts not so used would be returned to the firm.

If there is any fear that temporary diversion of part of the investment credit in this manner might weaken its effectiveness in serving the basic purpose of stimulating new investment, this problem could be met by raising the credit figure from the present 7 percent to, say, 10 percent. The suggested figures are illustrative only. The purpose of this proposal is not to reduce the stimulus to investment, but to incorporate with it an additional stimulus to meet the human problems of employees which may result from that investment. There is no reason why the program cannot be so devised that an average firm which does meet such problems would end up in the same financial position as it would be under the present investment credit provision—and the company which by constructive and imaginative measures succeeds in finding means of meeting the human problem with less than average costs would end up in an improved situation.

Benefits to Displaced Workers

The funds set aside with respect to any given firm could be used to provide the following forms of assistance to laid-off employees of that firm (the details as to amounts, periods of time, etc., are purely illustrative):

1. They would supplement unemployment compensation or retraining allowances up to 80 percent of the displaced worker's wages, for a length of time equal to his period of employment with the firm (time-for-time) up to a maximum of, say, 5 years.
2. If the worker accepted a new job at lower wages, his earnings would be supplemented up to 100 percent of his former earnings on the same time-for-time, 5-year maximum basis.
3. If the worker accepted a job with inferior protection in the areas of health services and life insurance—or with none—such protection would supplement up to the level of that on his former job on the same time-for-time basis.
4. Starting on a new job, the worker's vacation pay entitlement would probably be less than on his former job. The funds would supplement his vacation pay on the same time-for-time basis up to the level to which he would have been entitled if he had kept his former job.
5. If he had not been employed on the former job long enough to vest his pension credits, or if there were no vesting provision, the fund would purchase an annuity equivalent to the value of the service credits he has lost. If he finds employment on a new job which provides no pension, or an inferior pension, an additional annuity could provide an appropriate equivalent on the same time-for-time basis indicated above.
6. If the worker obtained a new job in another community during the same time-for-time period, the funds would pay his costs of relocation.

Eligibility Requirements

Appropriate eligibility qualifications would have to be worked out. For example, the worker might be required to have had at least 1 year of employment with the responsible employer.

Since it would be impracticable administratively to distinguish in individual cases between loss of employment caused by technology and that caused by other factors, objective criteria would have to be developed which would roughly accomplish the purpose. For example, all permanent separations (e.g., resulting from a plant closing, or where the employer certifies that a laid-off worker's recall was improbable) would be covered. In addition, continuous layoffs or short-time work for specified periods would establish eligibility for benefits retroactively to the beginning of the period. These periods should not be too long. Otherwise, loss of income, even if retroactively made up, would defeat the purpose of safeguarding the worker and his family against harm. In this connection, the layoff and short-time provisions of the new British Redundancy Payments Act, which also provides for separation pay (also in the context of stimulating modernization of industry) may be relevant. The act provides that a worker becomes eligible if he is laid off or on short time (i.e., receives less than one-half of his normal weekly pay) "either (a) for 4 consecutive weeks, or (b) for a series of 6 weeks (of which not more than 3 are consecutive) within a period of 13 weeks."

Operation of Trust Fund

The monies in the trust fund would be invested in Government bonds, in the same way as with the Social Security Trust Fund. The interest would be pooled to pay the excess of the costs charged to any one company over the amount of investment credit reserved with respect to that company. If at any time the total sum of such excess costs was in excess of the amount of interest available, the difference would be made up by the Treasury out of general revenues. In no event would an amount in the fund reserved with respect to one employer be used to pay costs attributable to another employer. For reasons shown below, such costs to the Treasury would probably be small.

Where a company has established programs to pay any of the benefits provided under the plan, the amount reserved from its investment credit would be reduced by the lesser of the amounts actually paid to its employees under such programs, or the amounts paid by it during the year into a trust fund to provide for such payments. (Benefits paid under such programs would be taken into account in computing benefits under this proposal.) This provision would encourage employers to establish such programs, since they would then benefit by the interest on the amounts by which their investment credit reservation would be decreased.

Effect of Proposal

The effect of this proposal would be to encourage firms to minimize dislocations resulting from technological change. The company would have a strong financial incentive to plan its changes so as to avoid dislocations, to find alternative jobs for workers disemployed, to train them for other jobs it may have to offer, and so on, since success in such efforts would increase the amount of reserved funds that would eventually be returnable to it. This encouragement to keep the costs attributable to technological change at a minimum would in turn minimize the possibility that there would be excess costs chargeable to the Treasury.

APPENDIX

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